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SUBSCRIBE to PCC

1

PCC is published 5 times (and sometimes more) during the school year. Subscriptions begin with the first issue in the fall.

2

If you are an elementary or secondary school student you can subscribe to PCC for $3.00. Send cash, check, or money order. No purchase orders. Use your HOME address! Please send us some evidence that you are a student.

3

Single subscriptions are $5 for 5 issues. ($6 outside U.S.A. - surface mail; $12 - air mail)

4

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10 - 99	$3.50 each
100 or more	$3.00 each

5

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2 - 9	$.80 each
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100 +	$.60 each

6

Buy a dragon shirt . . . See PCC Bookstore, pages 26 and 27.

CHRISTMAS SPECIAL → 7

Renew my subscription for 1975 - 76 for only $3.00 ****!!!

Send P.C.C. Volume 3, 1974 - 75 to a friend for only $3.00 *
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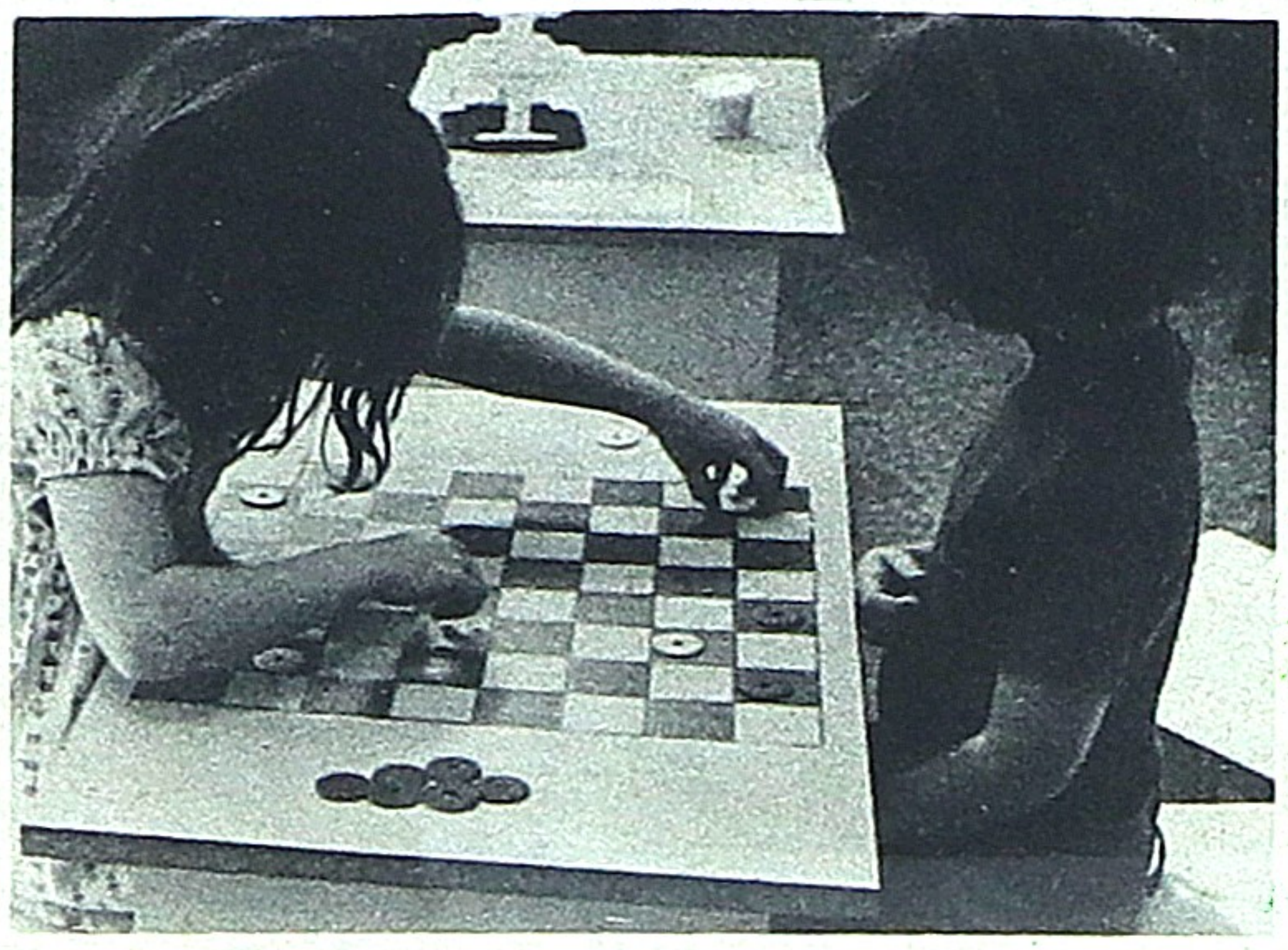
* OFFER EXPIRES JAN 1, 1975 ZIP

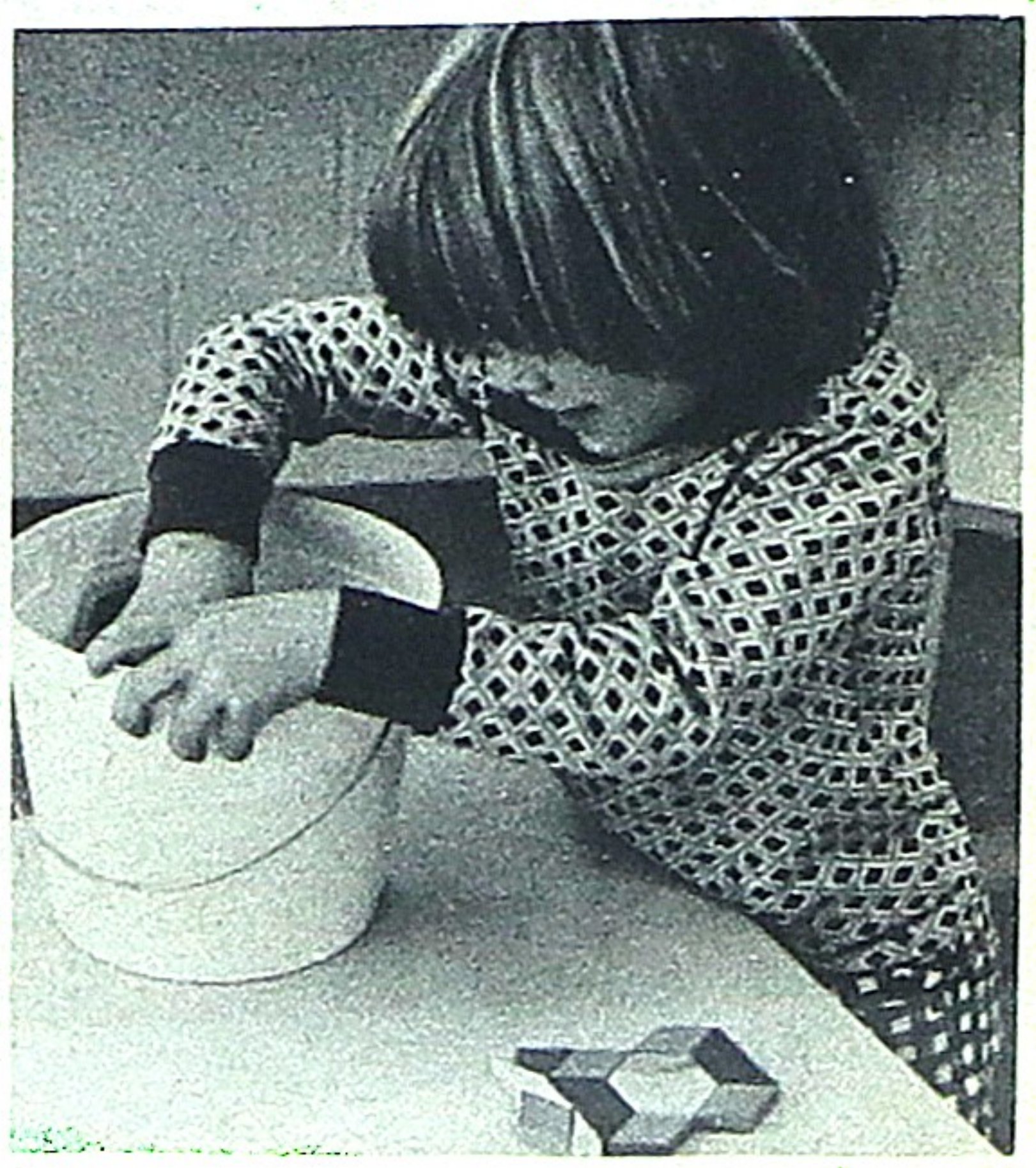
PEOPLE'S COMPUTER CENTER

The People's Computer Center is a friendly, non-profit, community computer workshop. We're a loosely-knit group developing and trying out games and recreational uses of computers.

We offer field trips and classes, both during and after school; people schedule birthday parties here and come to our Games Nights and open computer times.

We're in Menlo Park, California and our second year of operation.





Play Games at PCC

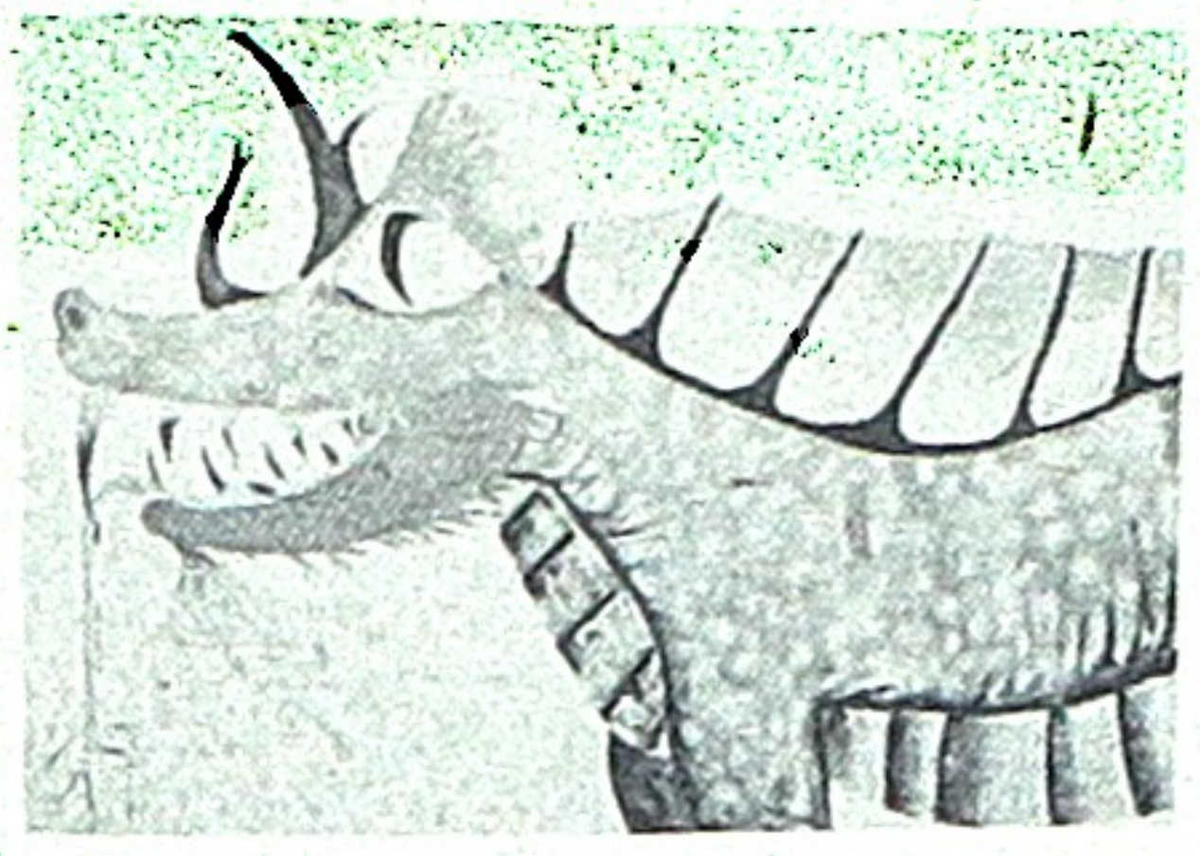
Play familiar games - checkers, Kalah, 3-D tic-tac-toe...

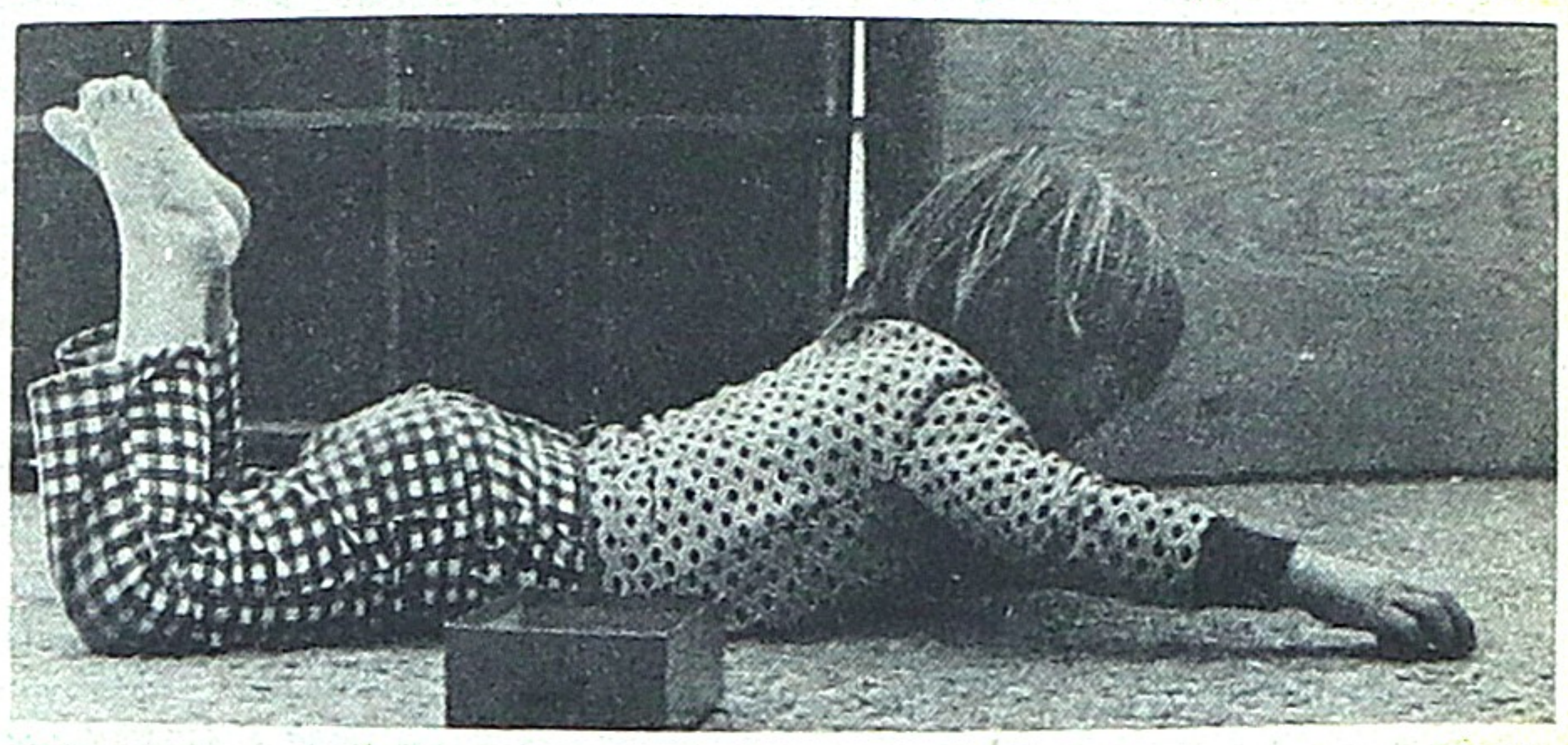
Learn and play some new games - Reversi, Gomoku, tangrams...

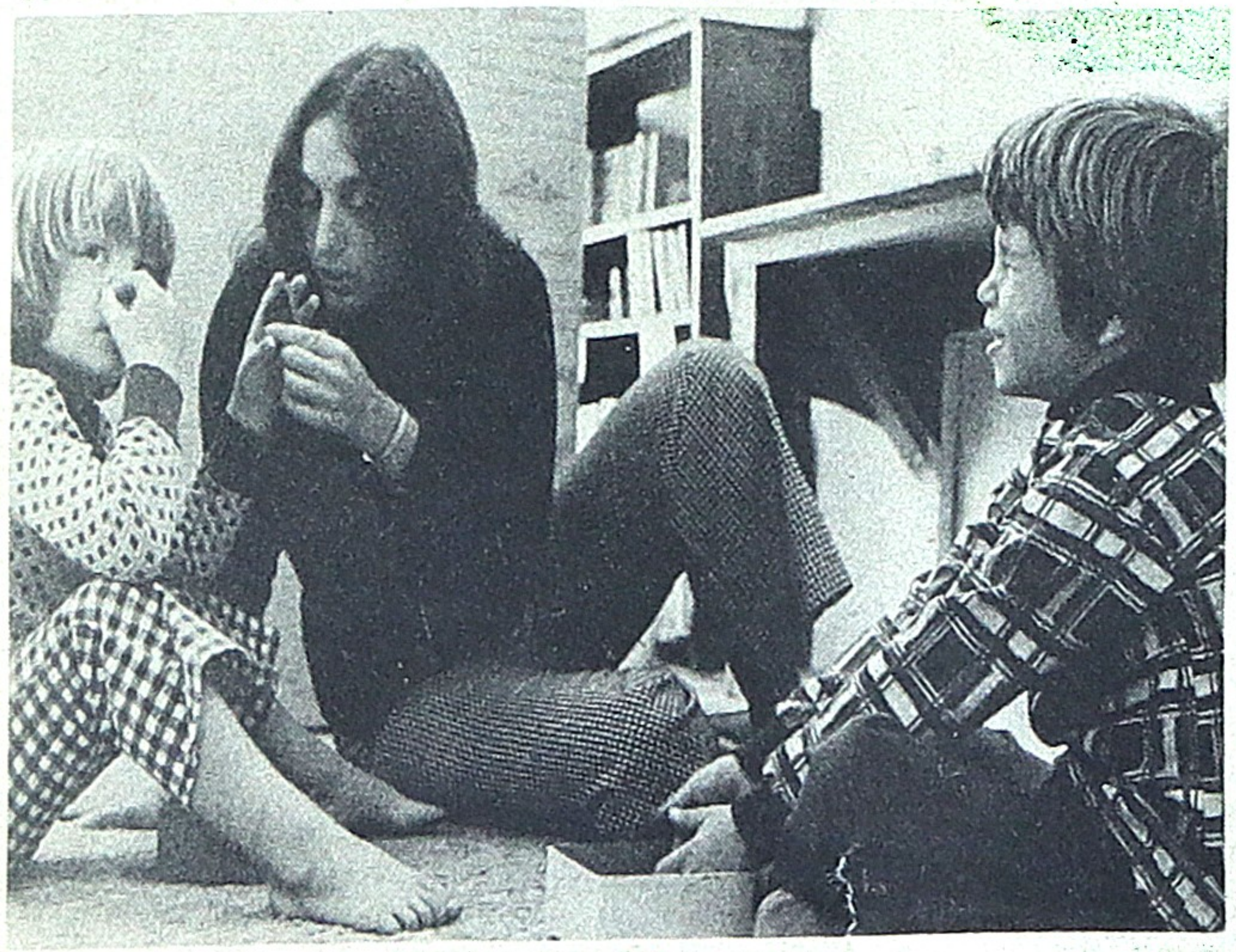
And some simple computer games - Stars, Number, Letter, Trap...

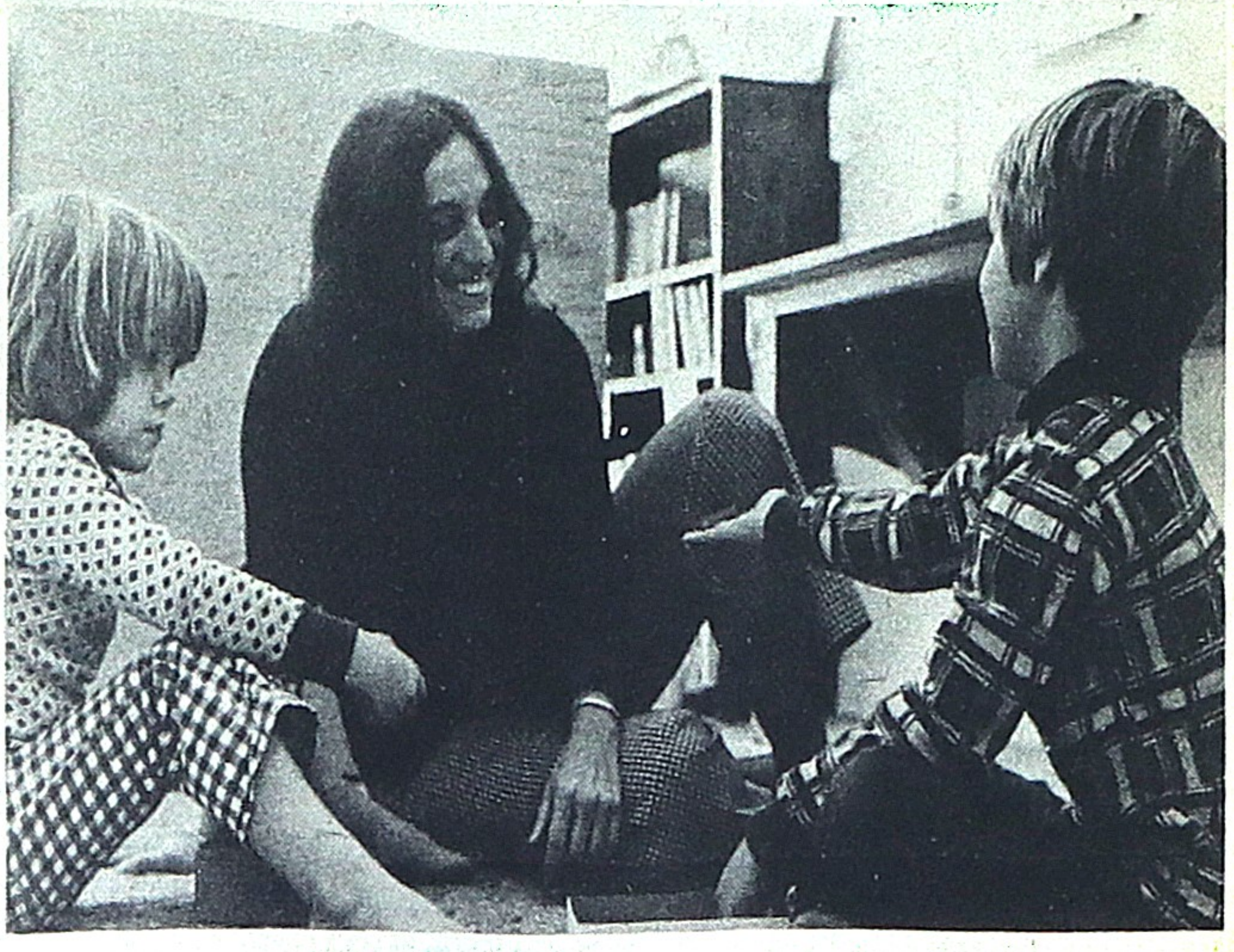
Fridays 4-5
Saturdays 10-11

Cost $5 a month









·LETTER·

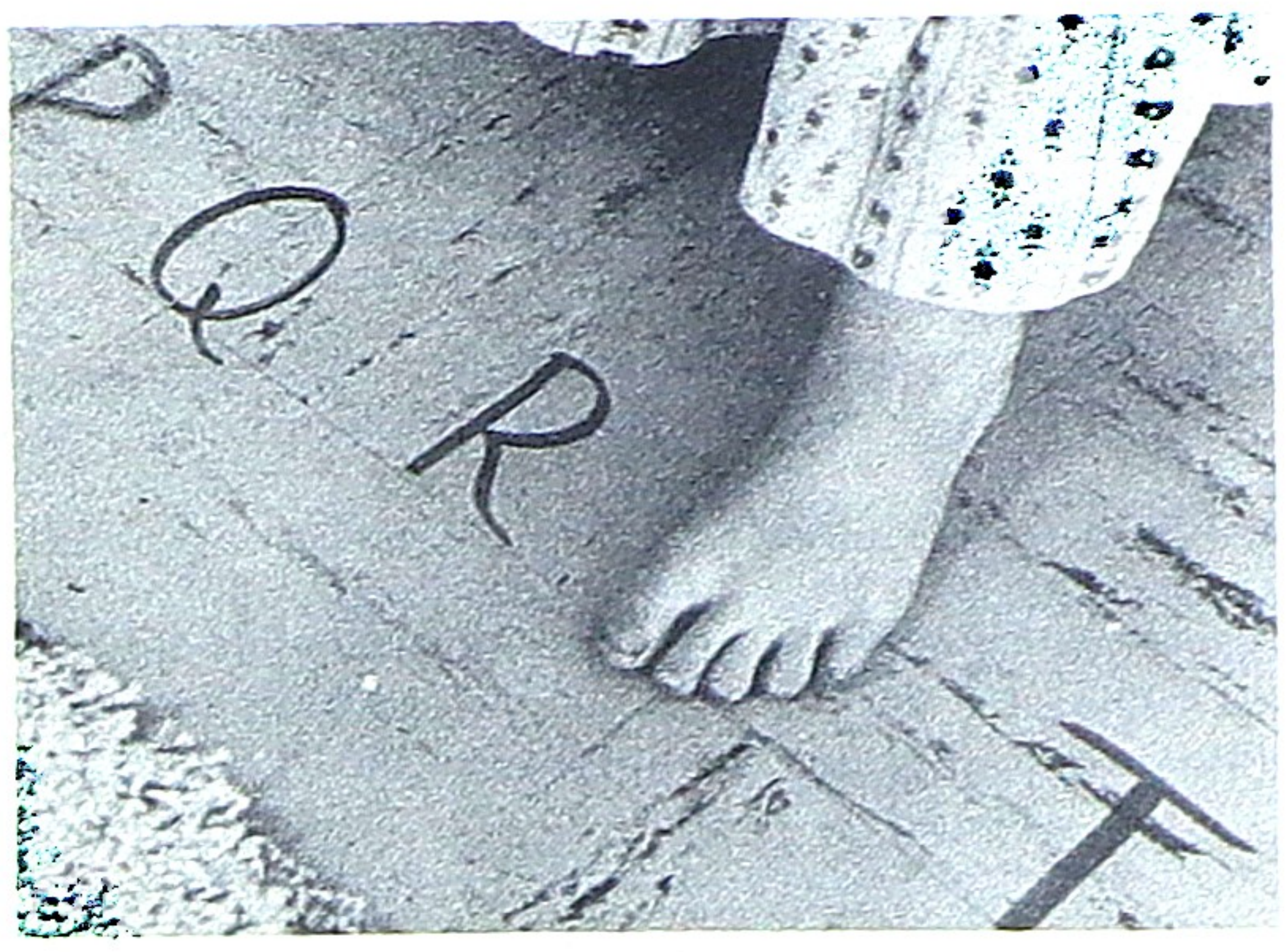
The computer will think of a letter between A and Z.

You try to guess the letter.

Guess a letter, type it, press RETURN.

"I'm thinking of a letter. You try to guess it, Peter."

"My turn. Is it S?"



— "No, too big."

· Shut Your Eyes ·

Do you think you can find a large square with your eyes shut?

Fantastic!

What about finding a small diamond?

Think you can find the small red diamond?

Whats in a Huntington Workshop

What's in a Huntington Workshop??? How do you run a workshop for newcomers to computers? Our philosophy has always been, "talk" little and "do" a lot. What follows is a description of our San Diego Workshop.

We started late (traffic), with an all male group, with no Huntington materials (shipping snafu), and general panic. The only high point at the beginning was that we were using a huge room at an HP sales facility with nine (9) terminals connected to an HP2000F (only ONE TTY, all the rest were CRT or fast printers). We soon discovered that our group was split between biology, social science teachers and an assortment of "others." Many had little or no computer experience. We kept our general comments short introducing Huntington history and a brief discourse on the computer hardware necessary to run the Huntington Two simulations (end of "talk at" portion).

Then it was MARKET. Divide our crowd (now including a few females) into teams, a brief explanation, sit down at the terminal and play MARKET. Excitement! Surprise! "How do I stop it?" "What's this, wage price freeze?" "What affect does advertising have?" . . . (read the materials) . . . "We win!" "12 million . . . we're broke."

Debrief . . . you got excited. Think your students will? What kinds of classes could you use this simulation in? What kind of preparation is necessary? What kind of learning takes place? Will YOU use it?

LUNCH – At HP, overlooking a smoggy valley (sorry San Diego Chamber of Commerce). Good meal.

HA HA! MY PROFITS ARE UP 20%!!
AUGH!!
MARKET
LET'S SEE... $1 MILLION, 2 MILLION..
I'M OFF 30!
PRICE FREEZE?!! THEY CAN'T DO THAT!
IT'S ONLY A GAME!
FORGET IT! WE JUST WENT BANKRUPT!
YOU DIRTY SWINDLER!!!
IT'S THE MACHINE! IT'S THE MACHINE!
Peter Katz

POLICY. A classroom economic simulation involving the entire group. Our attempt to demonstrate a large group simulation. POLICY includes role playing so we randomly divided the group into six teams. 30 brief minutes of explanation of the socio-economic model, 020 minutes of how to play and our very confused group started to negotiate with each other (it takes awhile to catch on to POLICY). It took 30 minutes or so to complete the first round of trading. Enter the data into the terminal and check the results. "Someone cheated! No fair . . . bet it was those business guys! Cheating shouldn't be allowed. You guys should make them turn in their points fairly." Cheating is a reality in this simulation . . . amazing how close it is to real life. How did we do? Round two and negotiations continue with more sophistication. They enjoyed POLICY. They learned from POLICY. They were concerned that POLICY is pretty sophisticated for high schoolers but they seemed willing to try it. (I've used it three times and added a few personal anecdote

Final exercise lasting until Saturday noon. (Homework at workshop?) You, you, and you . . . take these materials for HARDY. Grab a terminal. Read the materials. Try the exercises. Become experts on HARDY and prepare to report back to the large group tomorrow. George, you do the same with STERL. Your four try ELECT and so on.

Saturday, our experts reported. It was great. George figured out the STERL simulation and was able to control the screw-worm fly population . . . he was excited! Never could explain why they called it the *screw*-worm fly (read the resource materials for that subtle attempt at humor). Each team had excellent comments to make, not all were complimentary. One excellent contribution – The reading level of the resource materials is pretty sophisticated for kids with reading problems. Our San Diego group felt that many of the programs were still very usable for low level readers IF the teacher would take care to do a good job of explaining the subject matter and not rely on students reading the resource material.

Social studies teachers liked the ELECT programs for use in a variety of classes, the remaining time Saturday was spent running the programs recommended by fellow participants.

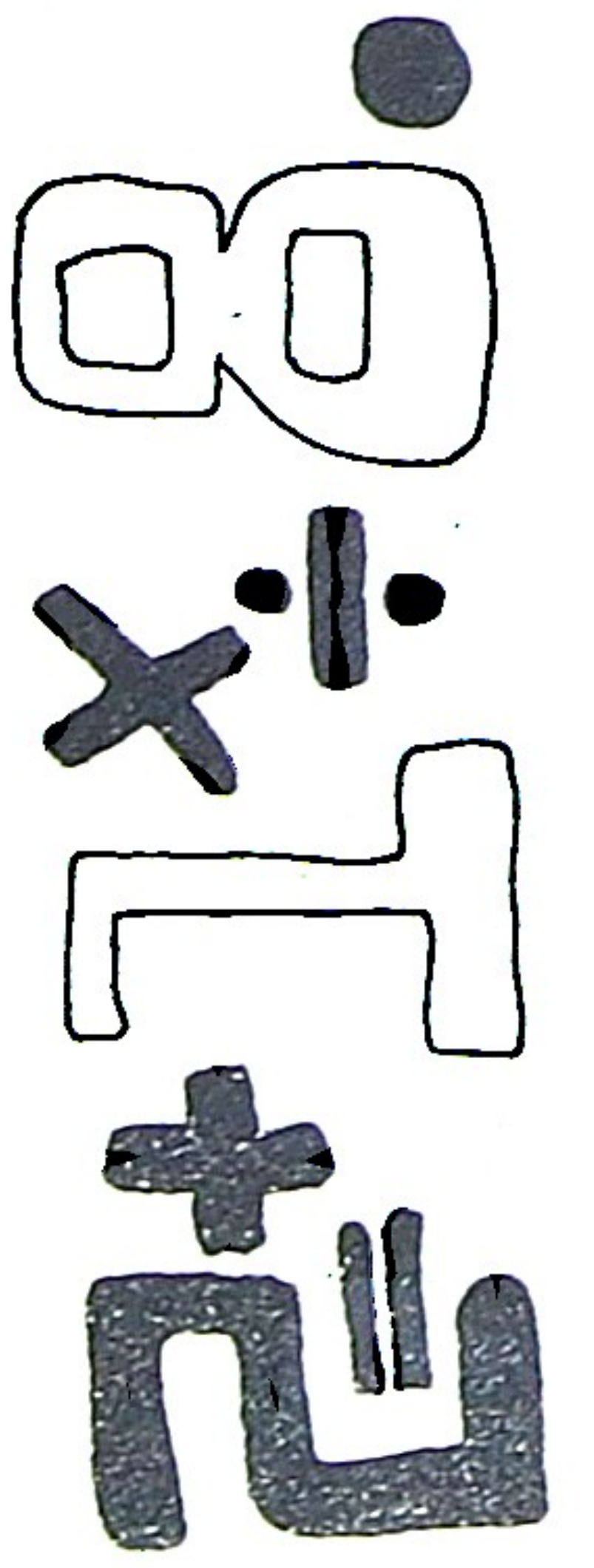
What a workout. Two full days of new experiences . . . but it was fun . . . and we all learned a lot and we all have lots of new ideas for our classes.

LeRoy

COMPUTER SIMULATIONS DEVELOPED BY THE HUNTINGTON TWO COMPUTER PROJECT

The HUNTINGTON TWO Computer Project's goal is to develop quality simulation programs to be used to enrich secondary school curricula in physics, biology and social studies. All HUNTINGTON TWO simulations provide opportunity for learning by student participation and observation.

The computer programs are written in the BASIC language and are restricted in size to allow users of smaller in-house computers to use simulations in their classrooms. Each program is available on paper tape and is accompanied by student, teacher and resource manuals. The cost of a complete package is $3.00.



The student manual contains the material that might be found in a student workbook: instructions, background, and follow-up questions.

The teacher manual describes how the program is used, what preparation the student will need to use the simulation, questions for discussion, and sample runs of the program to give the teacher an idea how the program runs.

The resource manual is designed to give detailed background on the program's model, and detailed information on the subject of the simulation.

The Project's work has been received with enthusiasm by teachers around the country. During the 1973-1974 school year, the publisher sold 25000 manuals associated with nine packages then available. It is estimated that these packages were used in 400 schools.

The publisher of HUNTINGTON TWO Computer Project materials is the DIGITAL EQUIPMENT CORPORATION. To order any of the following packages please write:

SOFTWARE DISTRIBUTION CENTER
DIGITAL EQUIPMENT CORPORATION
MAYNARD, MASSACHUSETTS 01754

SOCIAL STUDIES

ELECT 1,2,3 -- Election Simulation. This package focuses on campaign decision-making and electoral politics. *ELECT 1&2* simulates the strategy decisions in 14 American presidential elections of the past. *ELECT 3* is a role-playing game which can be used in the classroom to simulate a campaign and election.

LIMITS — Limits to Growth Model. *LIMITS* is a simplified simulation of world dynamics involving future changes in population, food supply, nonrenewable resources, industrial production and pollution. Students may alter the program assumptions about change in the future and let the computer project what may result in the next 125 years. (Simulation under development and will be available sometime during the 1974-75 school year.)

MARKET -- Elementary Marketing Simulation. *MARKET* simulates two companies in a one-product competitive situation. Students make marketing decisions, quarter by quarter, and the computer reports on their company's profit, share of the market, total assets and other decision-making information.

POLICY — National Policy Formulation Simulation. The role of special interest groups in making decisions regarding government decisions is examined. Students represent labor, nationalists, internationalists, business, military and civil rights special interest groups. The students attempt to organize to support or oppose governmental policies.

POLSYS -- City Government Simulation. This is a role-playing simulation in which the students represent opposing groups. The groups try to convince City Hall that their view of an issue is the one that City Hall should adopt.

SAP — Statistical Analysis Package. *SAP* is used to facilitate a student-conducted survey research project. The program is able to carry out mean and standard deviation for any item, construct a table of frequencies, compute Chi square, and many other statistical operations on survey data.

USPOP — Human Population Model of the United States. Using 1970 census data (stored within the program), the user explores the roles of fertility, birth distribution, offspring sex ratio, age-dependent mortality and population age structure in determining the pattern of population growth. Extensive materials supplied with the package explores each of the above factors from a biological and sociological point of view.

BIOLOGY

BUFLO -- Buffalo Herd Management Simulation. Both historic and current game management problems can be simulated with this package. The American buffalo, or bison, is used as the study example of a game species. This program can be easily applied to both population studies and ecology units.

DIET -- Dietary Evaluation Simulation. By specifying a typical intake of foods, a student can examine a diet for carbohydrate, protein, lipid and caloric content. The program will then match the value of the foods against dietary requirements. The calculation of recommended daily allowance is dependent on: age, sex, stature and activity. This program is designed for use with the human studies portion of biology programs but may find wide use in programs such as home economics and health. (Simulation under development and will be available sometime during the 1974-75 school year.)

GENE 1 -- Genetics Simulation. This program simulates a cross involving a single monohybrid genetic difference. The student specifies the genotypes of the parents and the number of offspring to be produced. The computer then lists all of the offspring's genotypes and phenotypes and calculates the ratios.

HARDY -- Hardy-Weinberg Law Simulation. *HARDY* leads the student through a population-genetics problem using the Hardy-Weinberg Law with data either from a simulated population, or data collected by the student as part of a classroom exercise.

LOCKEY — Enzyme Experiment Simulation. Students may explore the basis for the Lock and Key Model of enzyme action. The particular enzyme used in this study is *acetylcholinesterase*, an enzyme that is essential to nerve function.

MALAR — Simulated Malaria Eradication Program. The attack phase of a public health program, aimed at the eradication of malaria, is conducted according to student strategy. Results of the program over a 5-year period and evaluations of the student's program are printed. This program is particularly designed to be used with BSCS Yellow Version, but may be applied to any ecology unit.

PH -- pH Effect on Enzyme Function. A structural model of enzyme catalytic function allows the student to "design" his own enzyme and then test it for its pH optimum. The pH program is coordinated with the HUNTINGTON TWO's program *LOCKEY* and may be used either together or separately in the study of biochemistry.

POLUT — Water Pollution Simulation. This simulation allows the user to explore many of the factors leading to water pollution. Inputs such as "Type of Body of Water" and "Water Temperature" allow students to model bodies of water close to the school.

POP — Population Modeling Simulation. Three elementary models for population growth are presented. To lend interest, *POP* encourages the students to apply the models to the gypsy moth, then match the model's behavior against reality.

RATS — Rat Control Simulation. Strategies involving rat control in an urban area can be explored. Factors involving sanitation, pesticides, rat immigration and emigration are included.

STERL -- Sterile Male Pest Eradication. *STERL* is designed to test the effectiveness of two very different methods of pest control; the use of pesticide or the release of sterile males into the population. The two techniques may be used singly or in an integrated program, to control an infestation of screw worm flies. Ecology units concerned with the effect of pesticides in the environment can make use of *STERL*.

TAG — Wildlife Population Census Simulation. A simulated farm pond is investigated with the aim of establishing the population of large mouth bass. Students set up the investigation using the tagging and recovery technique. Elementary sampling concepts are taught through this ecological presentation.

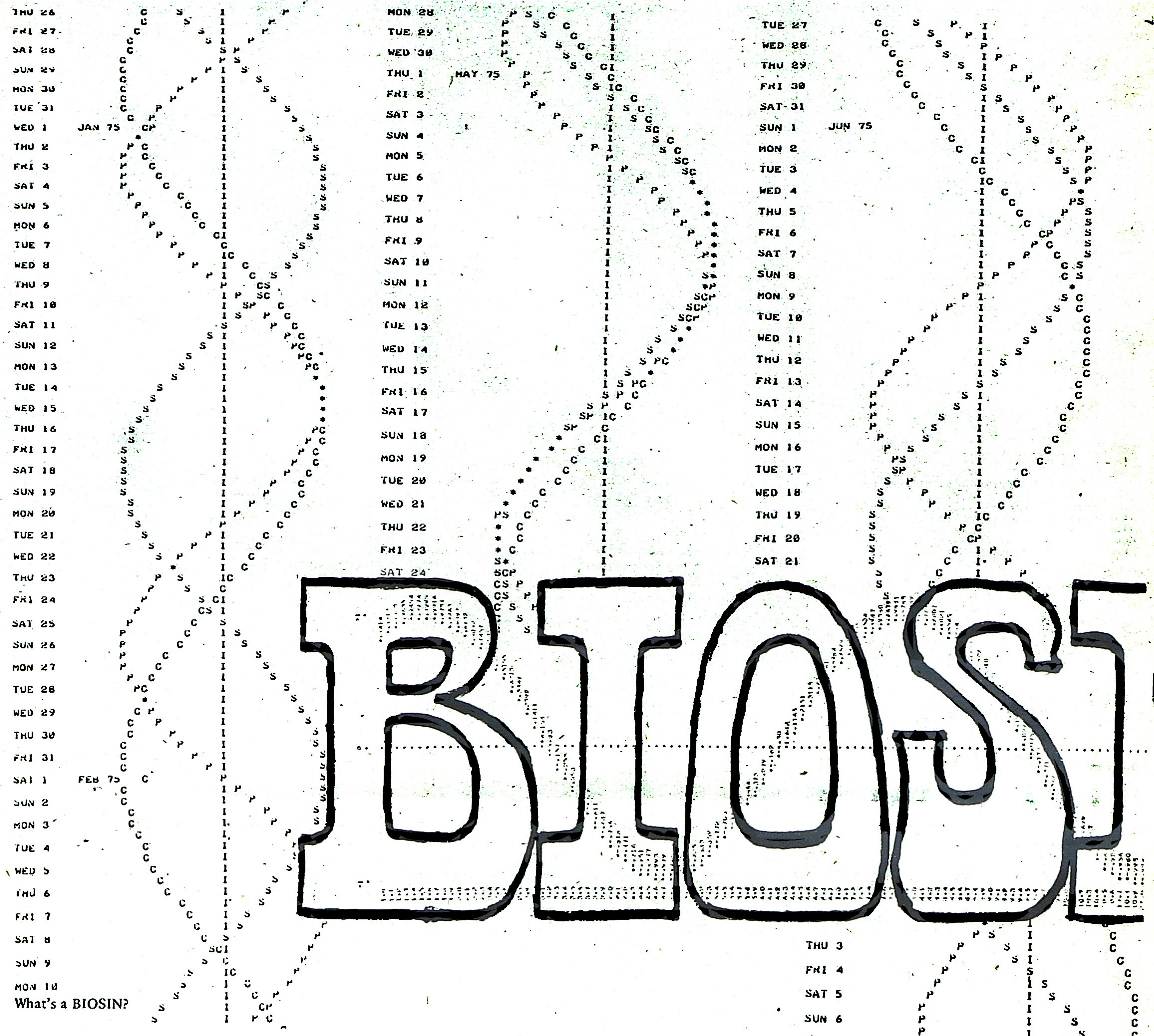
PHYSICS

CHARGE -- Millikan Oil Drop Experiment. The student carries out a modern version of the Millikan Oil Drop Experiment designed to demonstrate the existence of a discrete unit of electrical charge.

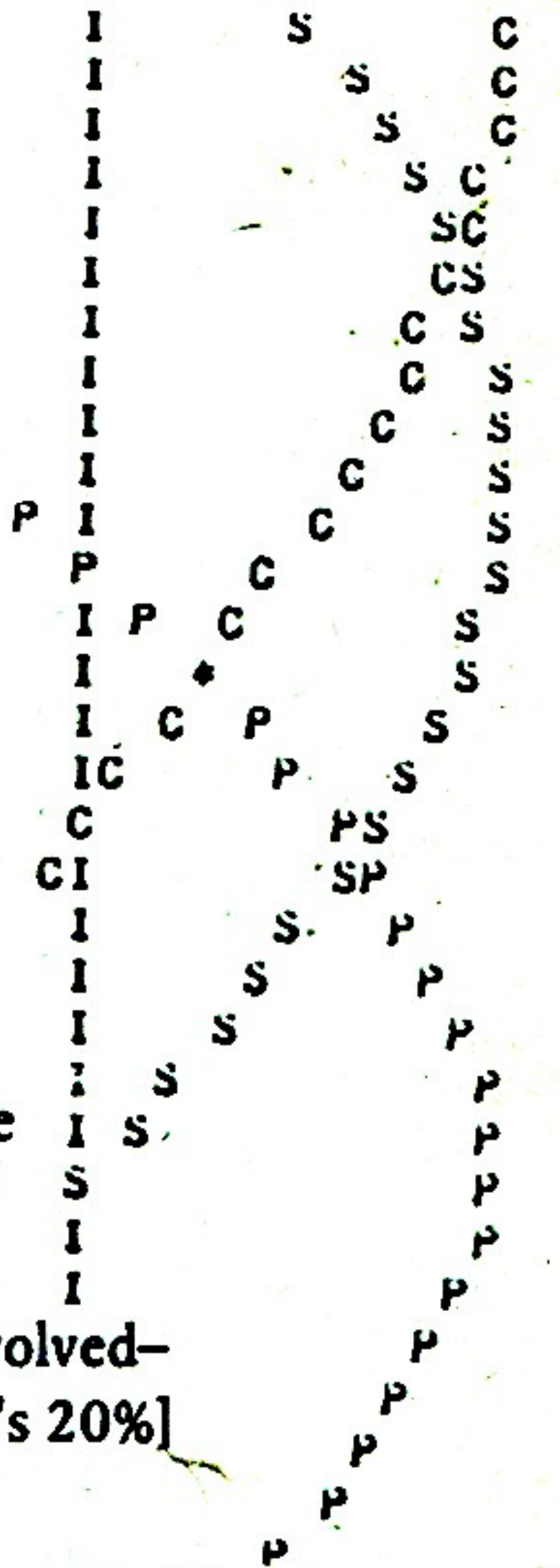
SCATR -- Rutherford Scattering Package. This package simulates alpha particle scattering according to three theoretical models of the atom: the hard sphere, the Thomson, and the Rutherford or nuclear model.

SLITS — Young's Double Slit Experiment. This simulation allows the student to easily study several of the more difficult parameters involved in the wave interference of light. The computer allows greater flexibility than would be found in the classical high school experiment.

QUANTA -- Photoelectric Effect Simulation. *QUANTA* allows the student to investigate how cathode material, wavelength, and intensity of radiation affect photoelectric emission. Both classical and Einstein models for this phenomena are explored in different portions of this simulation. (Simulation under development and will be available sometime during the 1974-75 school year.)

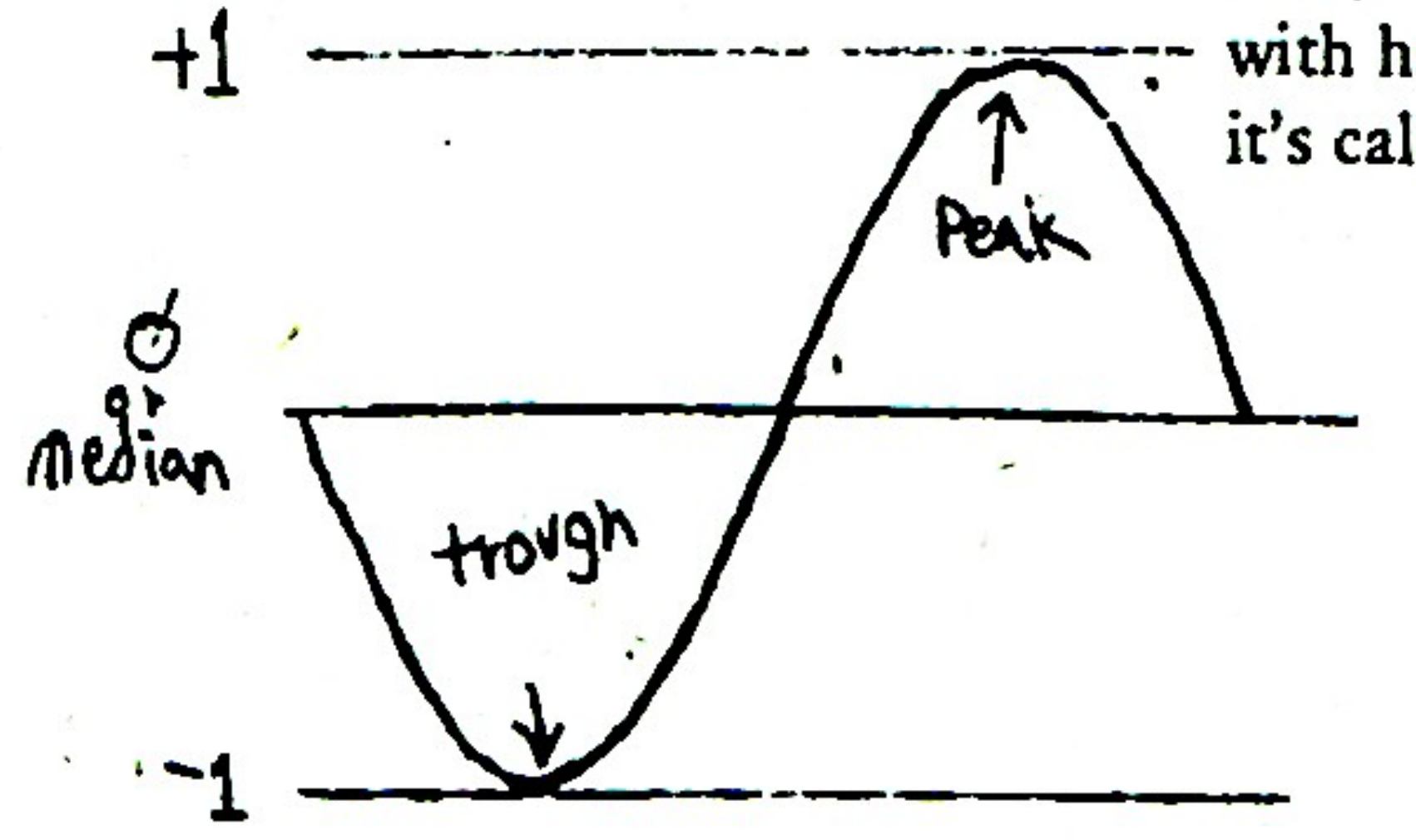


What's a BIOSIN?



A Sinewave is what you get when you graph the function y=sin(x).

it looks like this:



Well, that's what you get when you put half of BIOrhythm" together with half of "SINewave". [when you put two words together like that, it's called an acronym].

A Biorhythm is a theoretical metabolic cycle that is constantly going on inside everyone, starting at birth, or the beginning of independant life. To date, three such cycles have been discovered.

These cycles were observed by several people working separately around the beginning of the 20th century.* In one of the studies made, Hans Schwing studied the biorhythmical aspects of 700 random accidents and found that nearly 60% of the accidents happened on a "critical" day for the person involved– yet on the average, only one out of every five days is a "critical" day. [that's 20%]

There are 3 biorhythmic cycles. Each may be represented by a sinewave. When the sinewave hits the median, you are said to be having a critical day for that cycle. When the sinewave troughs, you are said to be on the recuperating side of the cycle. And when the sinewave peaks, you are most apt to do well at whatever the cycle affects.

The first cycle, the "Physical" cycle is 23 days long. It was first discovered by Dr. Willhelm Fliess, and it affects physical vitality, stamina, and endurance.

The second cycle, the "Sensitivity" cycle is 28 days long. It affects sensitivity and emotion. [note that this cycle is exactly four weeks long, and thus you have a critical day every other week. Furthermore, your critical days for this cycle will always be the day that you were born on- say you were born on a Monday, every other Monday would be a critical day for you]

The first two cycles affect whether or not you are going to have an accident the most. The third cycle, lasting 33 days, is the "Cognitive" or intellectual cycle. It affects your creativity and ability to absorb information.

Grafics by the Aardvark

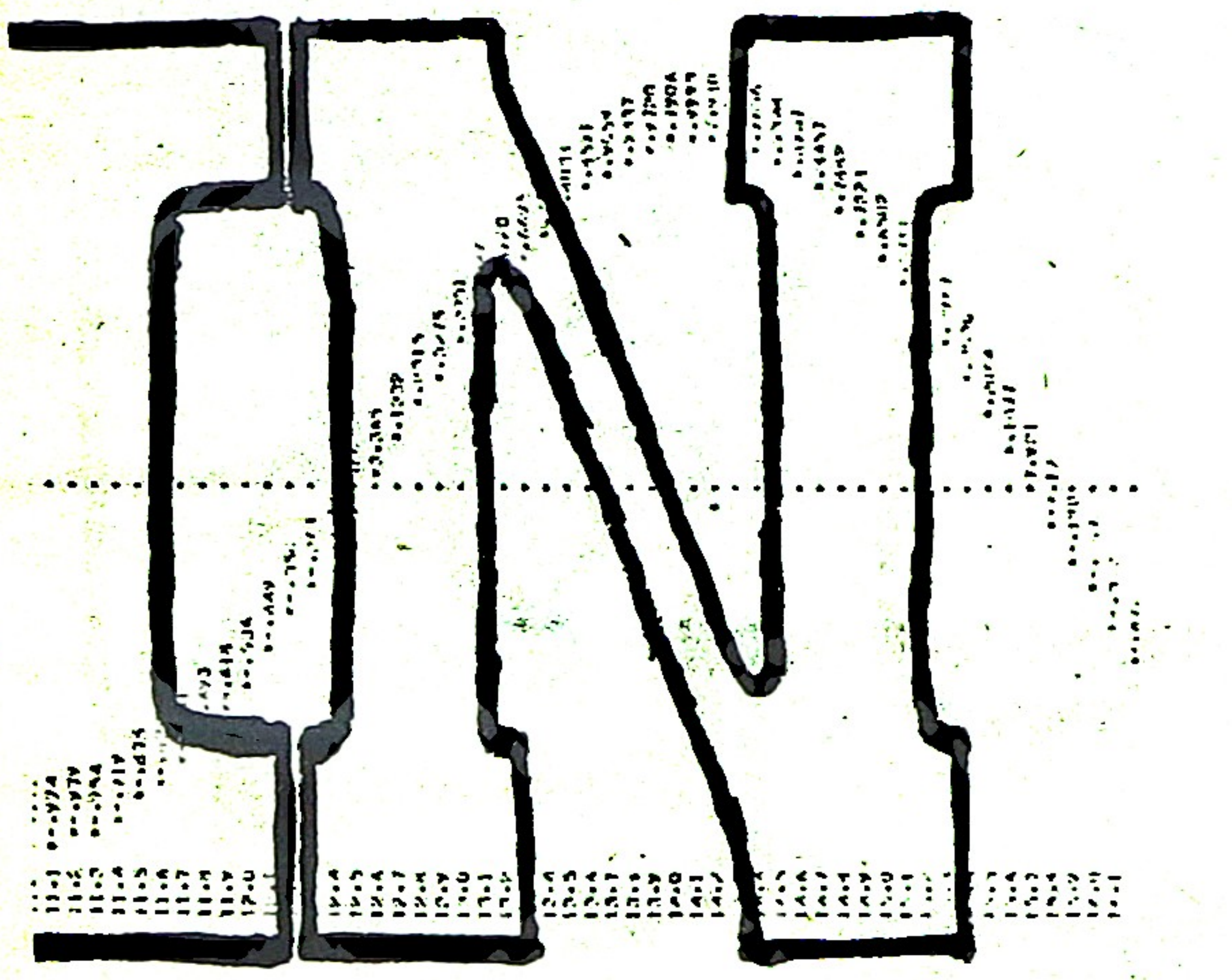
---

*For more information, refer to *Biorhythm Theory* by Dr. R.E. Smith
published by Control Data Corp.
8100 34th Avenue South
Minneapolis, Minnesota 55420

BIOSIN

```
10   REM*********************************************************
20   REM** COPYRIGHT 1971 BY THE REGENTS OF THE UNIV. OF CALIF.    **
30   REM** PRODUCED AT THE LAWRENCE HALL OF SCIENCE, BERKELEY      **
40   REM** (MODIFIED AND DOCUMENTED BY THE AARDVARK AT THE PCC)    **
50   REM*********************************************************
60   REM
70   DIM A$[21],B$[36],C$[72],A[12]
80   REM** A IS AN ARRAY CONTAINING THE NUMBER OF DAYS IN EACH MONTH
90   MAT  READ A
100  REM** FNY IS THE NUMBER OF DAYS IN FEBRUARY OF THE YEAR Y
110  DEF FNY(Y)=29-SGN(Y/4-INT(Y/4))
120  REM**  FNS IS THE SINEWAVE FUNCTION
130  DEF FNS(S)=INT(14*SIN((S/P-INT(S/P))*6.28318)+30.5)
140  REM** FNM IS THE REMAINDER OF X AND 7
150  DEF FNM(X)=INT(7*(X/7-INT(X/7))+.5)
160  A$="MONTUEWEDTHUFRISATSUN"
170  B$="JANFEBMARAPRMAYJUNJULAUGSEPOCTNOVDEC"
180  PRINT " DO YOU KNOW WHAT A BIORHYTHM IS [Y-N]";
190  INPUT C$
200  IF C$[1,1]="Y" THEN 500
210  PRINT "      THE BIORYTHEM THEORY POSTULATES THAT THERE ARE CERTAIN"
220  PRINT "METABOLIC RHYTHMS THAT HAVE A CONSTANT CYCLE TIME IN THE HUMAN"
230  PRINT "BODY, AND ARE KNOWN AS INNER CLOCKS."
240  PRINT "     TWO PHYSICIANS, ONE A CONTEMPORARY OF FREUD, CONCURRENTLY"
250  PRINT "DESCRIBED A 23-DAY CYCLE THAT CORRELATED WITH PHYSICAL "
260  PRINT "VITALITY, ENDURANCE, AND ENERGY; AND A 28-DAY CYCLE THAT"
270  PRINT "CORRESPONDS TO SENSITIVITY, INTUITION, AND CHEERFULNESS. A"
280  PRINT "THIRD CYCLE WAS OBSERVED BY A PROFESSER AND OTHERS IN THE"
290  PRINT "1920'S AND 1930'S, AND IS A 33-DAY COGNITIVE OR INTELLECTUAL"
300  PRINT "CYCLE THAT RELATES TO MENTAL ALERTNESS AND JUDGEMENT."
310  PRINT "     ALL THREE CYCLES START UP FROM BIRTH OR THE BEGINNING OF"
320  PRINT "INDEPENDENT LIFE."
330  PRINT "      THE DAYS ON WHICH THE MEDIAN (0) LINE IS CROSSED ARE "
340  PRINT "CALLED CRITICAL DAYS, ESPECIALLY FOR THE PHYSICAL AND SEN-"
350  PRINT "SITIVITY CYCLES AND ARE WHEN ACCIDENTS ARE THE MOST LIKELY"
360  PRINT "TO OCCUR.  THE HIGH (+) PERIODS IN THE VARIOUS CYCLES ARE THE"
370  PRINT "TIMES WHEN YOU SHOULD HAVE THE MOST ENERGY, BE MOST CHEERFUL,"
380  PRINT "OUTGOING AND MENTALLY ALERT.  THE LOW (-) TIMES ARE REGARDED"
390  PRINT "AS RECUPERITIVE PERIODS."
400  PRINT "      ALTHOUGH ALL CYCLES ARE SAID TO START FROM ZERO AT THE"
410  PRINT "TIME OF BIRTH, BIORHYTHM HAS NOTHING TO DO WITH ASTROLOGY."
420  PRINT "      A TOKYO TAXI COMPANY HAS REPORTED A 60% CUT IN ACCIDENTS"
430  PRINT "BY GIVING DRIVERS AN 'EXTRA-CAREFUL-TODAY'REMINDER ON "
440  PRINT "CRITICAL DAYS"
450  PRINT "GRAPH SYMBOLS:     I : MEDIAN LINE          (0 LINE)"
460  PRINT "     P : PHYSICAL CYCLE        (23-DAY)"
470  PRINT "     S : SENSITIVITY CYCLE     (28-DAY)"
480  PRINT "     C : COGNITIVE CYCLE       (33-DAY)"
490  PRINT ""
```

At least I don't have to sharpen it, but I hope I don't run out of lead...
zZ



```
500  K=1
510  PRINT " BIRTHDAY (MM,DD,YYYY)";
520  INPUT M,D,Y
530  REM** THE BELOW REDUCES A NUMBER TO ONLY ITS 10'S AND 1'S DIGITS
540  Y=INT(100.1*(Y/100-INT(Y/100)))
550  REM** CHECK FOR ERRORS
560  A[2]=FNY(Y)
570  IF M<1 OR M>12 OR ABS(M)#INT(M) THEN 1550
580  IF D<1 OR D>A[M] OR INT(D) <> ABS(D) THEN 1570
590  REM** NOW CONVERT D TO JULIAN
600  FOR I=1 TO M-1
610  D=D+A[I]
620  NEXT I
630  K=2
640  PRINT " PLOT STARTING DATE (MM,DD,YYYY)";
650  INPUT M1,D1,Y1
660  D0=D1
670  REM** THE BELOW DOES THE SAME AS THE ABOVE FOR PLOT DATE
680  Y1=INT(100.1*(Y1/100-INT(Y1/100)))
690  A[2]=FNY(Y1)
700  IF M1<1 OR M1>12 OR ABS(M1)#INT(M1) THEN 1550
710  IF D1<1 OR D1>A[M] OR INT(D1)#ABS(D1) THEN 1570
720  FOR I=1 TO M1-1
730  D1=D1+A[I]
740  NEXT I
750  REM** 'S' WILL END UP BEING HOW MANY DAYS FROM BIRTH TO PLOT DATE
760  S=0
770  REM** FIRST, ADD IN LEAP YEARS FROM BIRTH TO PLOT DATE
780  FOR I=Y+1 TO Y1-1
790  S=S+(I/4=INT(I/4))
800  NEXT I
810  REM** NOW CHECK FOR BIRTH YEAR BEING LEAP
820  S=S+(Y/4=INT(Y/4) AND D>58)
830  REM** WE ADD HOW MANY YEARS OLD YOU ARE * 365
840  S=S+(Y1-Y-1+(D1 >= D))*365
850  REM** AND FINALLY, WE ADD HOW MANY DAYS SINCE THE LAST BIRTHDAY
860  S=S+(D1 >= D)*(D1-D)
870  S=S+(D1<D)*(730-D-D1)
880  IF S<0 THEN 1590
890  REM** D3= HOW MANY DAYS FROM THE YEAR 1900 TO PLOT DATE
900  D3=Y1*365+D1
910  FOR I=1 TO Y1-1
920  D3=D3+(I/4=INT(I/4))
930  NEXT I
940  PRINT " HOW MANY DAYS DO YOU WANT PLOTTED";
950  INPUT D9
960  D9=D9*2
970  D1=D0
980  REM**              START OF PRINTING  ****************
990  PRINT "";TAB(20);"(-)        (0)        (+)"
1000 FOR W=1 TO D9
1010 REM** C$ IS THE OUTPUT STRING
1020 C$=""
1030 IF D1 <> INT(D1) THEN 1130
1040 REM************** SET UP DATE*******
1050 E=FNM(D3-1)+1
1060 REM** YOU WILL NOTE THAT 1/1/1900 WAS A MONDAY
1070 PRINT A$[3*E-2,3*E];
1080 PRINT D1;
1090 IF D1 <> 1 THEN 1130
1100 PRINT B$[3*M1-2,3*M1];
1110 PRINT Y1;
1120 REM*********** SET UP PRINTING****
1130 FOR X=LEN(C$)+1 TO 72
1140 C$[X,X]=" "
1150 NEXT X
1160 FOR X=1 TO 3
1170 P=5*X+18
1180 X[X]=FNS(S)
1190 NEXT X
1200 C$[30,30]="I"
1210 C$[X[1],X[1]]="P"
1220 IF X[1]#X[2] OR X[1]#X[3] OR X[2]#X[3] THEN 1250
1230 C$[X[1],X[1]]="*"
1240 GOTO 1350
1250 IF X[1]#X[2] THEN 1280
1260 C$[X[3],X[3]]="C"
1270 GOTO 1290
1280 IF X[2]#X[3] THEN 1310
1290 C$[X[2],X[2]]="*"
1300 GOTO 1350
1310 C$[X[2],X[2]]="S"
1320 IF X[1]=X[3] THEN 1230
1330 C$[X[3],X[3]]="C"
1340 REM** OUTPUT C$
1350 FOR X=15 TO 72
1360 IF C$[X,X]=" " THEN 1380
1370 PRINT TAB(X-1);C$[X,X];
1380 NEXT X
1390 PRINT
1400 REM**  RESET DATE
1410 D3=D3+.5
1420 S=S+.5
1430 D1=D1+.5
1440 IF D1<A[M1]+1 THEN 1510
1450 D1=1
1460 M1=M1+1
1470 IF M1<13 THEN 1510
1480 M1=1
1490 Y1=Y1+1
1500 A[2]=FNY(Y)
1510 NEXT W
1520 PRINT ""
1530 GOTO 180
1540 REM**          ERRORS  ***
1550 PRINT "IMPROPER MONTH"
1560 GOTO 1580
1570 PRINT "IMPROPER DAY"
1580 GOTO K OF 510,640
1590 PRINT "PLOT STARTING DATE EARLIER THEN BIRTHDAY"
1600 GOTO 640
1610 DATA 31,28,31,30,31,30,31,31,30,31,30,31
1620 END
```

BIOSIN — Notes

Top section: Initialization

A[1] is the number of days in January, A[2] is the number of days in February, and so on. You'll note that FNY is always used to determine how many days are in February of a particular year. [see lines 560 and 690]

Middle section: Parameter input and processing

A glance at line 1580 will tell what K is for. The operation in line 540 takes the first two digits of Y-so if Y was 1973, it would turn into 73. [so would 19073, or 73. This program assumes that you were born in the 20th century] Lines 750-930 are basically doing this: Multiplying your age at the plot date by 365, adding the leapyears between your birth and the plotdate, and adding how many days since your last birthday before the plotdate. Don't be scared by the boolian logic used here. An expression such as X=Y, X>=Y, X<=Y,etc. are equal to 1 if true, and 0 if false. In line 960, we multiply D9 by 2 because in the next section, we loop 2 times for each day.

Bottom section: Output

Note that inside the "" in line 990 are return linefeed characters. The reason for line 1090 is that we only want to execute lines 1110 and 1100 [i.e. print out the year and month] if it is the first of the month. If lines 1160-1190 seem a little bit confusing, remember that X is not the same as the subscript X and that subscript has a default dimension of 10x10. Also, p is 23 on the 1st loop, 28 on the 2nd, and 33 on the 3rd. See the opposite page for the explanation of the significance of those numbers.

I would like to thank The Lawrence Hall of Science, U.C. Berkeley for permitting me to print this listing.

A FANTASY OF

Last issue, we visited The Cybernetic Theatre, one of the storefronts which make up the complex of neighborhood Centers. This month, we're going to step back and look at the ENTIRE complex of offices, classrooms, theatre, workshops, art studios that make up the complex... which could be ANYWHERE there are people interested in making it happen!

by Dave Kaufman

MENLO PARK, CA. The sun is rising and shining thru the light morning fog hurdling the hills and I wonder to my sleepy self: *What the hell am I doing up this early?* 7 AM it is, but the street is already peopled: There are carpenters, bakers, craftspeople, dancers, photographers, computer artists, gamesters and tricksters and, probably, a pickpocket or two.

They're setting up stalls on the sidewalks, a dance floor in the street. Banners are going up, lagging in the chilly early morning. Tables are being set up, with breads and fruit and cakes and sandwiches and huge containers of punch for lunch.

Now the banner is going up, spanning the busy street:

ANNUAL SUMMER FAIR
Sponsored by the 8 Neighborhood Centers

And the neighborhood is finally waking up. Someone with a megaphone climbs a chair: "All right, it's 7:30 – we'll be opening in half an hour. Volunteers are still needed to man, oh, *people* the information booth from 1 till 2 and 3 till closing time, 4. If you haven't signed up for chores, see me or Albert and we'll give you info duty."

Shirley's megaphone drones on, but your reporter is more interested in what's going on in the street, on the sidewalks, and in the storefronts.

There's a juggler tossing colored bowling pins in the air and catching *most of them.*

Here and there an early-morning couple is leaning our of their doorway, laughing secretly as the street scene resolves its madness and motion into the local Summer Fair.

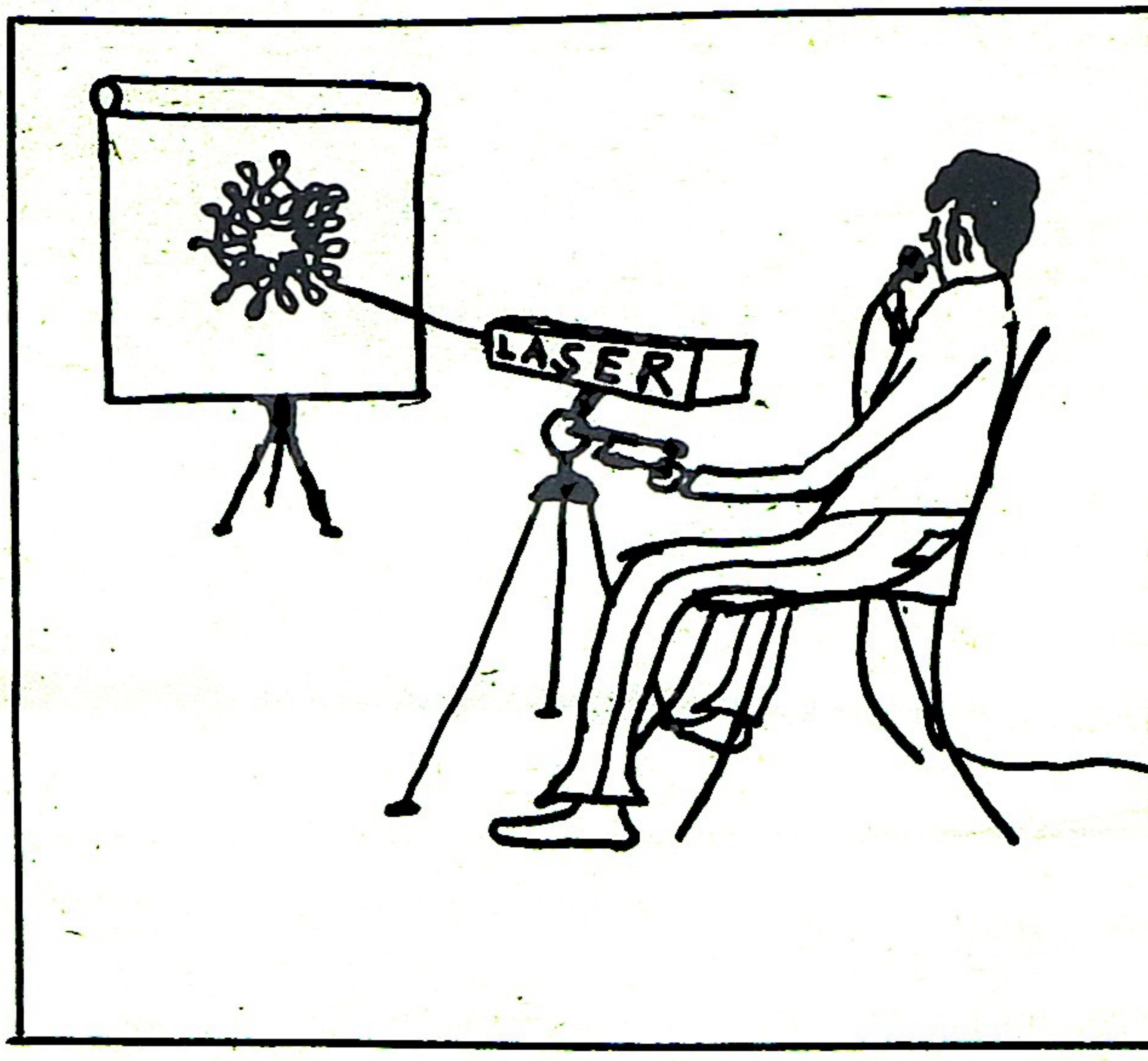
BIFF THE JESTER

"Hurry Hurry Step Right Up Don't Miss It Today Only." Biff is playing crier today and is dressed in jester's long long long pointed-toe red-felt shoes and floppy, bell-tinkling cap and black tights and bright red-green-blue-black-yellow-orange-purple jerkin saying on the back: "Follow Me Anywhere." Biff seems to speak with capital letters and never ever pauses long enough for a period or comma to be inserted.

Biff isn't the only jester. Seven of the Drama Center regualrs are dressed just as . . . well, as . . . as Biff and they're banging doors, tantalizing children, passing out literature and in general, bringing the neighborhood awake this beautiful Saturday morning.

As Shirley finishes the last of the details, the street population seems to double with people bringing out the art works, computer terminals, musical instruments, chairs and odds and ends that'll go in the booths.

There's a silk-screen show put on by some of the Art Studio regulars. Some are from photos, some of them were done from imagination. Some incredibly color-rich ones were done from computer works. They're all for sale.



Someone is setting up a laser. "Hi" I say, tentatively, "are those holograms? Going to do some tricks with your laser?"

"This is the Laser Light Show I'm setting up" says he. "I'll be doing three shows today, with this ruby-red laser and some props." He opens an attache case. Inside are jewels, wine glasses, an assortment of what looks like empty cans each with plastic over one end and a time mirror set in the plastic. There's also a collection of holograms, sections of stained glass . . . "Times are 1:30, 3:00 and 4:00. This morning, I'll be showing people how to make their own holograms and some of the things you can do with them." He smiles and starts setting up some displays with pictures, words, holograms.

In front of the storefront that just says "Coffee House" on its windows, they're bringing out chairs and small tables and flower pots. Small trash cans go under the tables and salt-pepper-sugar-cream on top. A billboard is carried outside:

Coffee 75 ¢ Tea 50¢

Breakfast $3.50

Lunch $3.00 – $4.50

Dinner $4.00 – $6.50

MEMBERS ONLY

Hmmmm . . . breakfast . . . Why not?

Sitting down becomes quite an adventure as my seat wobbles around, trying to make itself comfortable. The two of us reach a compromise, with half of me off and half on.

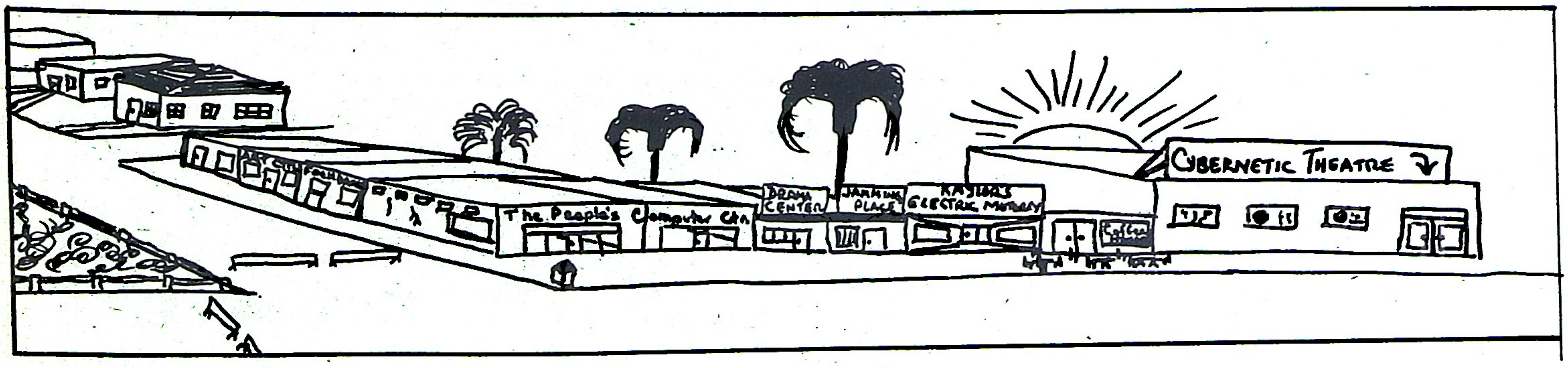
Jim comes walking up. "Hi. You here for breakfast too?" Jim is an old friend of mine who invited me to the Fair.

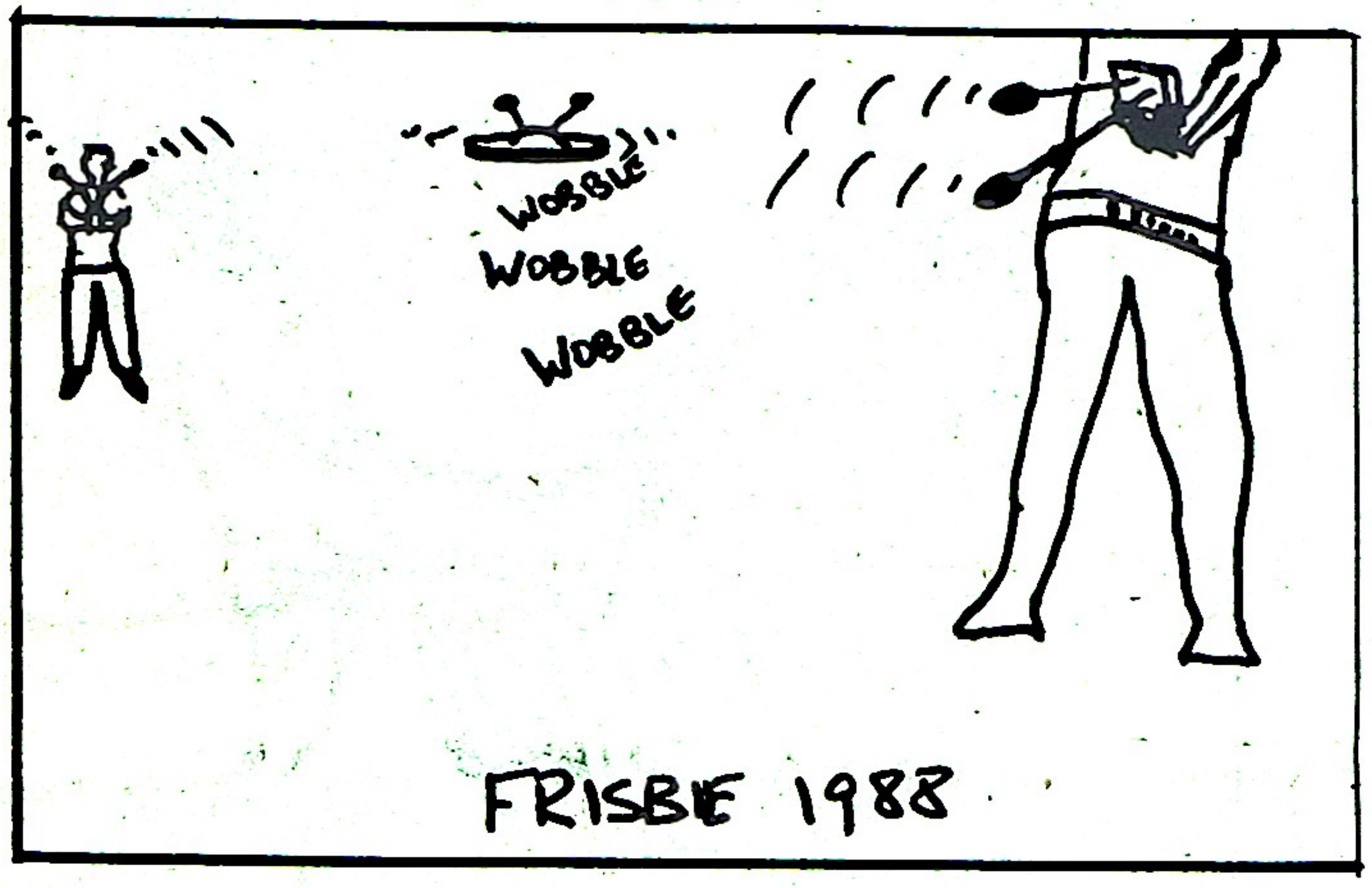
"I'm having yogurt and granola, and pot of jasmine. How's the yogurt here?"

"It's usually fresh and tart," Jim says. "I'll be having the baklava and some Mexican coffee."

Page 8...

FUTURE FORMS

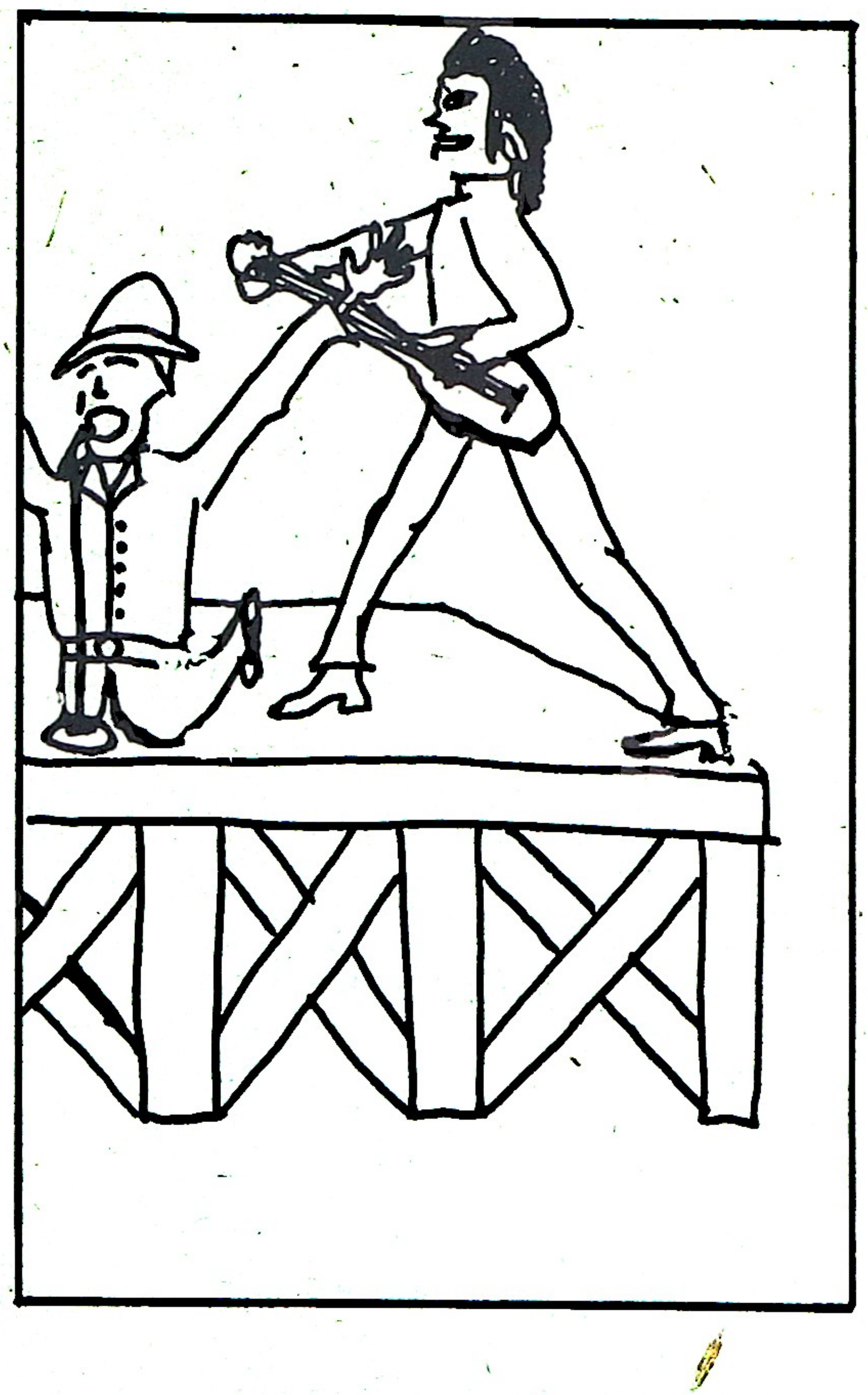




THE FRISBIES COME OUT

Frisbees are appearing up and down the street. Someone runs off and returns with Shirley, and they quietly but sternly talk to the frisbee crowd. There's an animated but hushed shouting exchange and the frisbees, dogs and people go off down the street. The Musicians are starting up. Something light, something low, music to soothe the newlyawakened Jim and I spend the morning discussing the history and evolution of the Centers.

There's the Cybernetic Theatre, theCoffeeHouse, the Art Studio (silk screens, photograph, acrylics, sculpture and pottery), the Jamming Place, the Folkdance Basement (on the level), the double-storefront People's Computer Center, the Drama Center, the People's Publicity and Press and small, equipment-packed one called Kaylors Electrical Motorcycles.



A LITTLE HISTORY

The first storefront was the People's Computer Center which opened 14 years ago, in 1974. That was the first of the Centers. First a single storefront, it expanded to two soon after.

A couple of years after it opened, they rented a third storefront and called it the Folkdance Basement. It originally had a dance floor for folkdancers, with tables and chairs and couches in the back, where the original Coffee House got started.

Two, maybe three years later (Jim's memory isn't too specific, or maybe the next stage took awhile) the Coffee House people got a storefront of their own and took out a restaurant license, and opened a small bar—restaurant. Mostly, it was a social hang-out for people in their mid-twenties most of who weren't employed in those days.

Around that time, the Computer Center replaced its old teletypewriters with TV screens, some color ones. When that was done, the Center really took off.

Enough capital was brought in by the Folkdance Basement and Coffee House to finance a silkscreen workshop. At first, the PCC staff ran it, with color photos from computer art programs. It was a smashing success.

People who had been hanging around the Coffee House and Folkdance Basement began taking jobs in the silkscreen workshop, turning out art prints and selling them around the Bay Area.

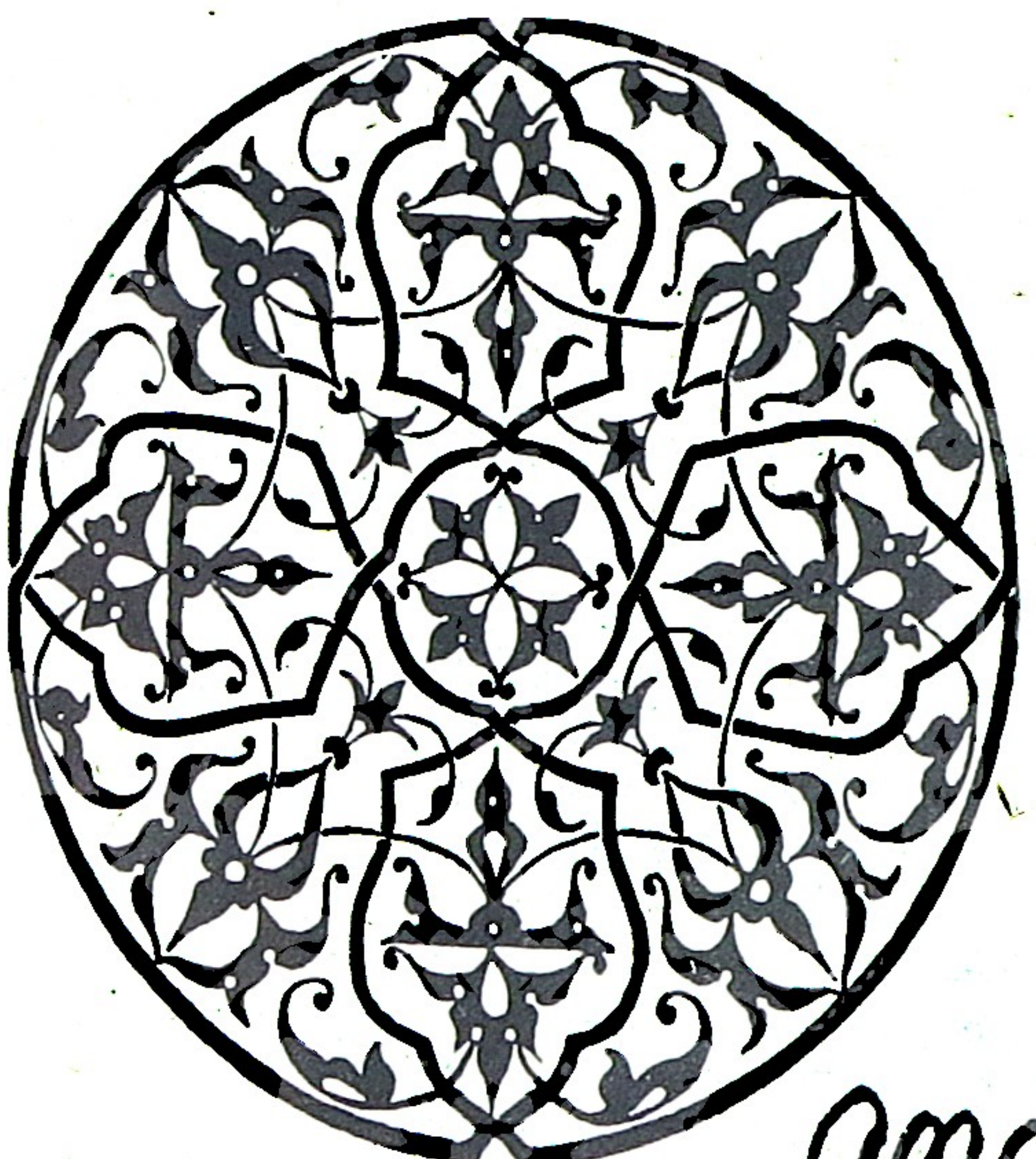
Sometime during that period, the silkscreen workshop became a full-fledged Neighborhood Center, with money earned going towards equipping a photographer's studio and buying pottery equipment.

Tuesday nite at the Folkdance Basement was musicians' open nite. The better groups began performing on the weekends. It wasn't long before they spun off to form the Jamming Place, with monies from the other successful centers.

Somehow, the Drama Center got started as a place to go to act or watch rehearsals and performances.

The Cybernetic Theatre was begun last of all and took the most in resources to set up.

Each Center earns enough thru membership subscriptions and admission charged to pay its overhead, with a little left over. The big successes, the Cybernetic Theatre, Coffee House and Folkdance Basement, have a huge surplus. Mostly, the money is used to finance small projects and support for visiting artists and performers.



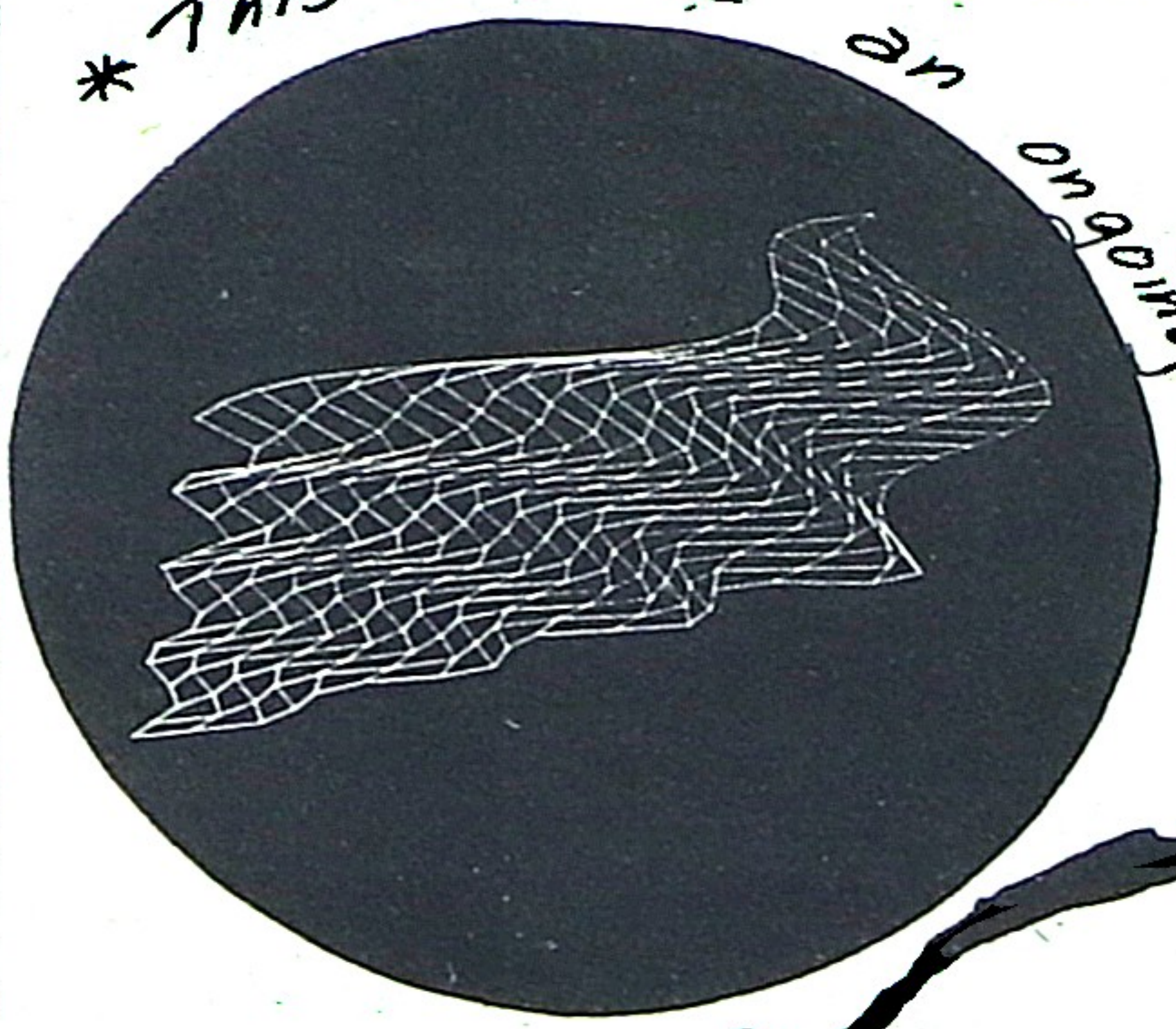
and 9

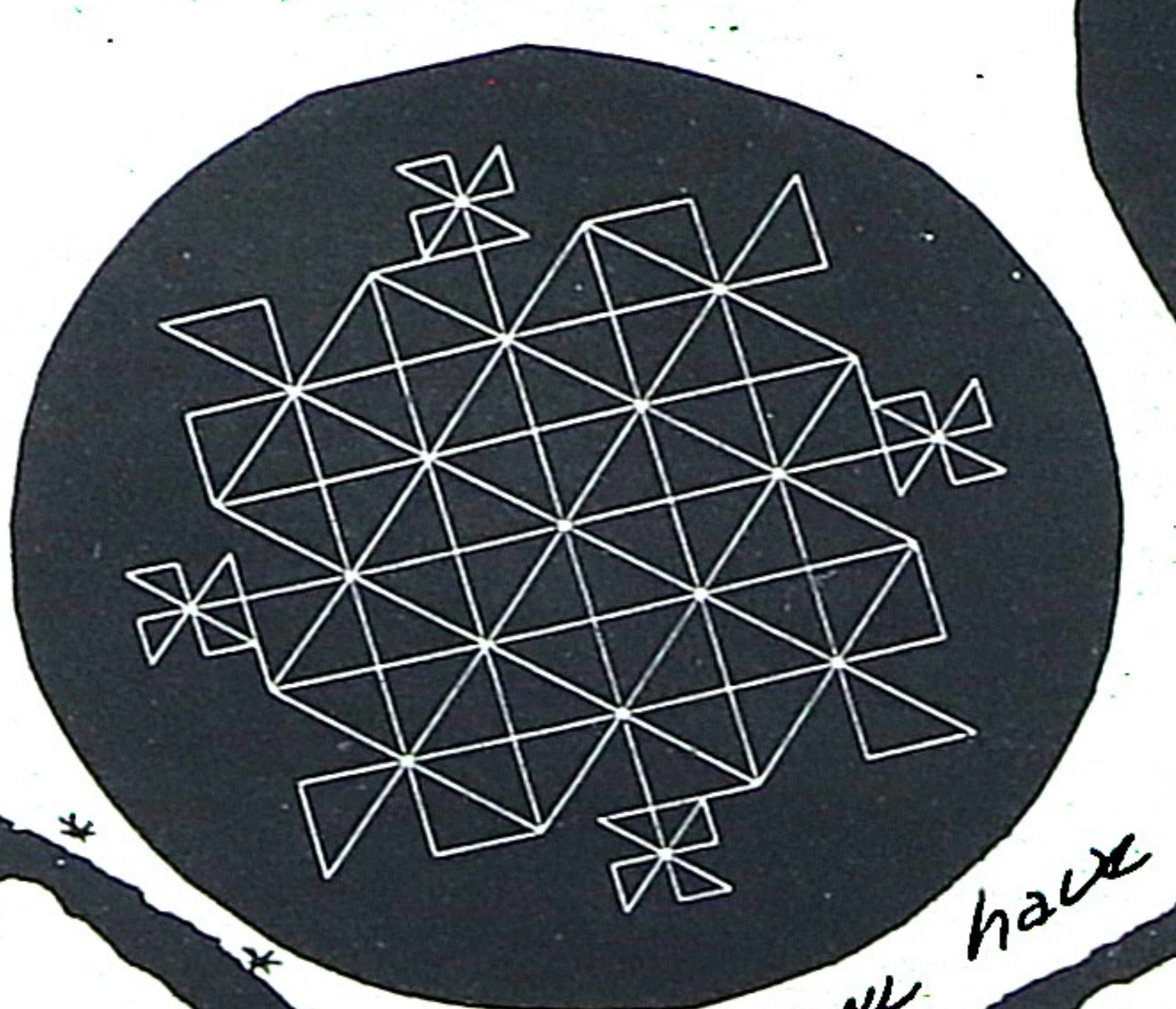
ART INFO SOURCES

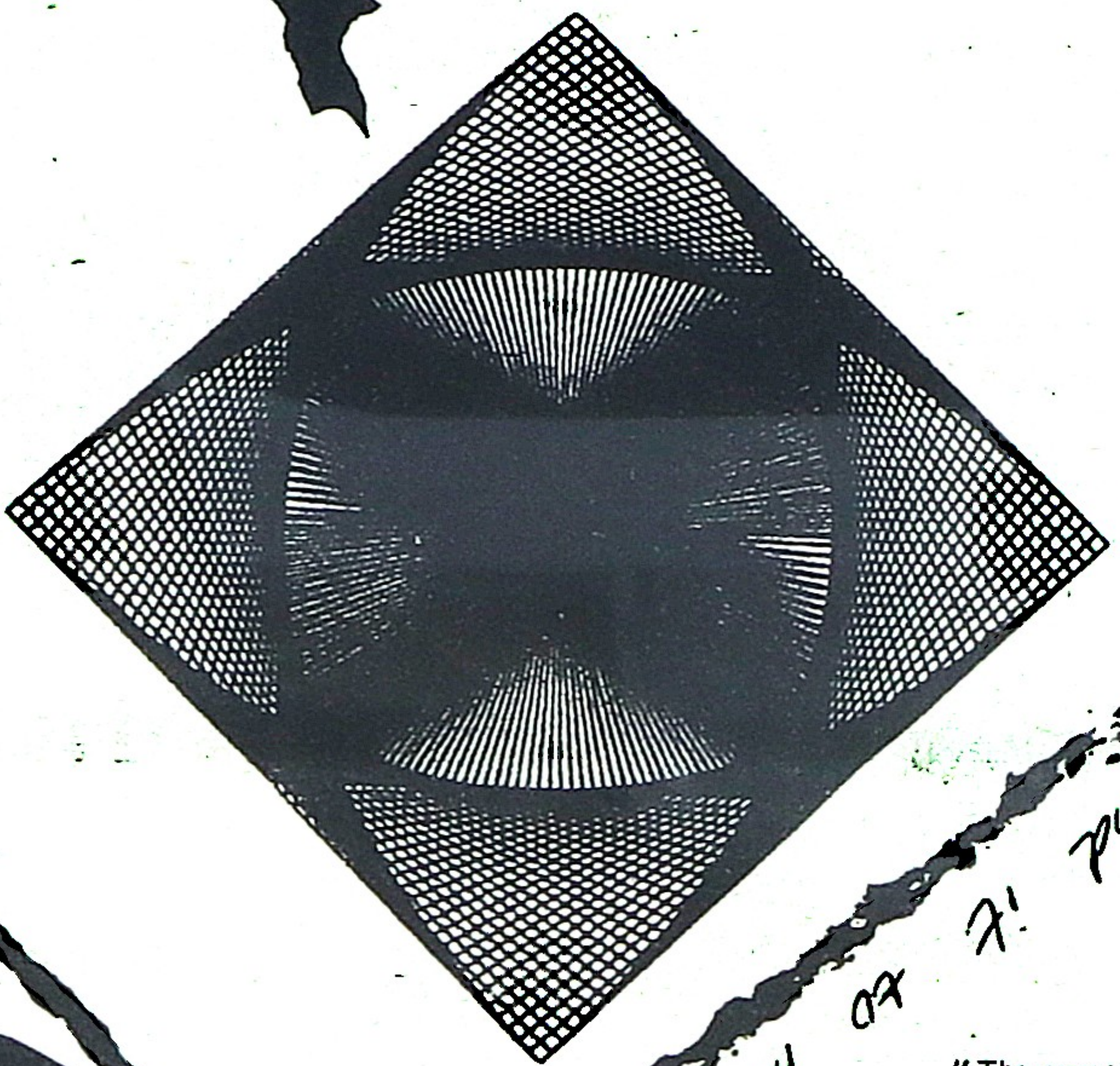
* This will be an ongoing page * * * *

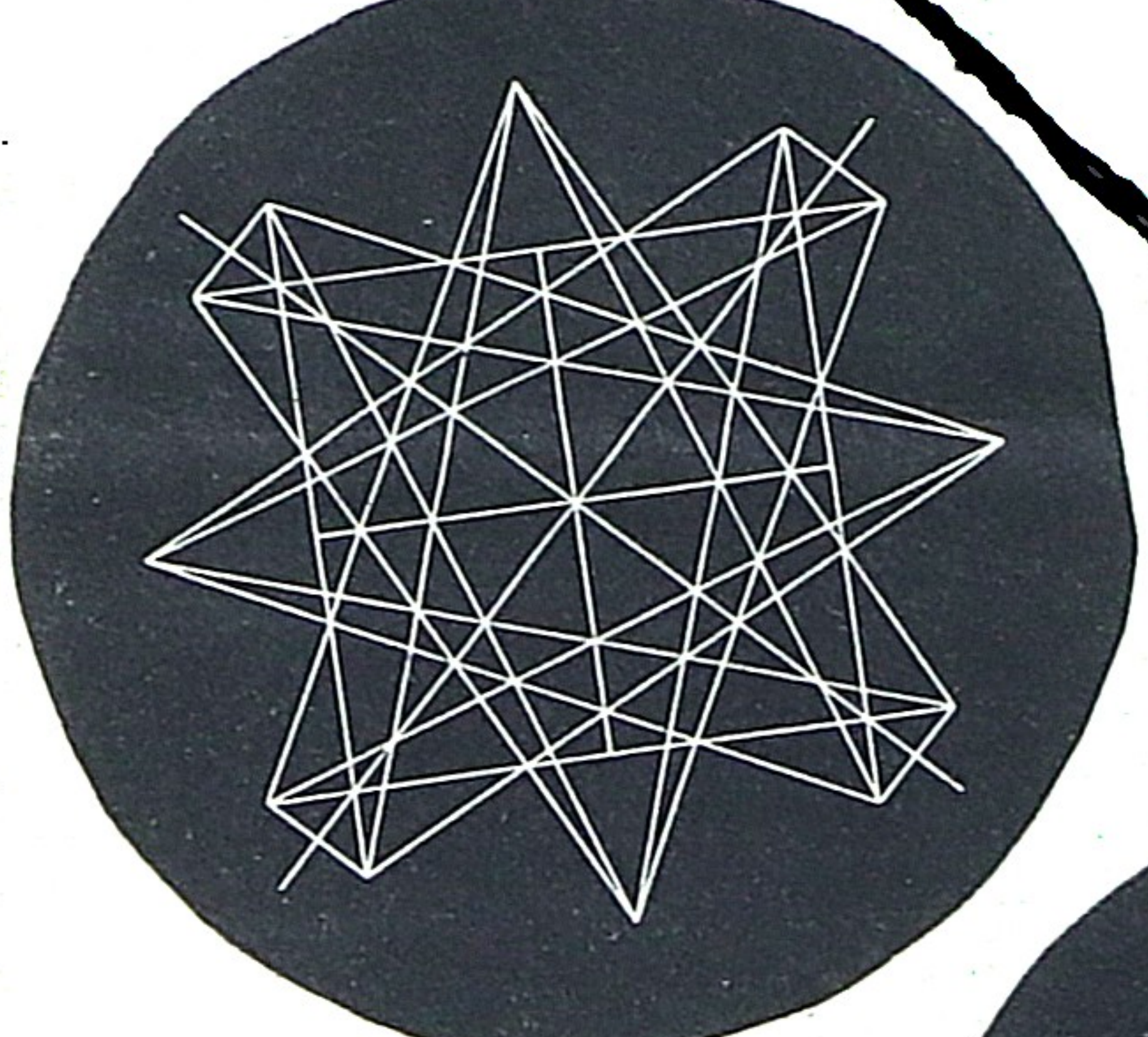
* If you have any interesting information regarding ART and TECHNOLOGY, * * * Please send it to me * * *

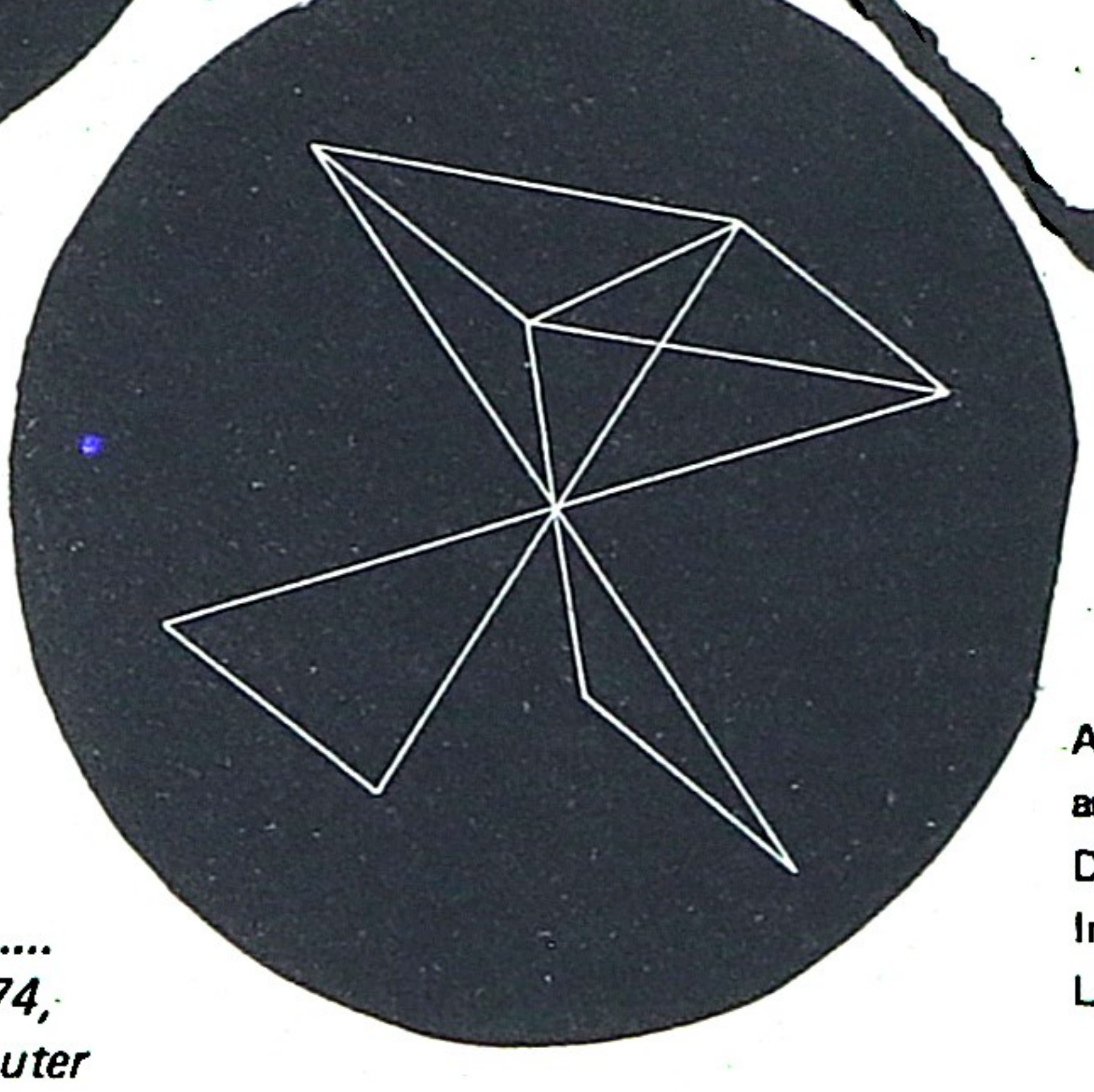
Pam Scarvie











All of the graphics in the spheres came from an article in the October,1974 issue of Modern Data magazine entitled "Graphic CRT Displays-Interactive Computer Graphics - A Current Look" by Maurice I. Stein.

See...
Computers and People, *August, 1974, Vol.23, No.8. .12th Annual Computer Art Exposition*

Available from:

Berkeley Enterprises, Inc.
815 Washington St.
Newtonville, Ma. 02160

" Interactive mapping has become a critical need, because the world turns in more ways than one. A six - month - old map of oil sources, for example, would be history today.

In this rapidly changing world, the surface of the earth itself is often the only constant base to which other human and physical facts can be related.

If you're mapping, you're in our territory. If you're not mapping, perhaps the following applications stories will give you an idea of how you could be. It's a fascinating technique with vast potential. We'd like to help you explore it."

see: TEKGRAPHICS, April 74, Number 9
Tektronix,Inc.,Information Display Division
P.O. Box 500, Beaverton, Oregon 97005

****

Excellent Excellent Excellent Excellent

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special Computer Graphics issue of the PROCEEDINGS OF THE IEEE, April 1974, Volume 62, Number 4, published monthly by The Institute of Electical and Electronics Engineers,Inc.
Here are titles of the papers printed:

" The challenge of Computer Graphics in Continental Western Europe," R.A. Guedj
" Building Highway Systems With Computer Graphic Simulations," T.J. Moffett
" Computer Graphics in Urban and Environmental Systems" R.L. Phillips
" Three - Dimensional Data Input by Tablet," I.E. Sutherland
" The Art of Natural Graphic Man - Machine Conversation," J.D. Foley and V.I. Wallace
" An Approach to Graphic System Design," W.M.Newman and R.F. Sproull
" Intelligent Satellites for Interactive Graphics," A.van Dam, G.M. Stabler, and R.J. Harrington
" Computer - Encouraged Serendipity in Pure Mathematics," C.M. Strauss
" Portfolio of Shaded Computer Images," R.D. Resch
" Computer Graphics and Art," C. Csuri

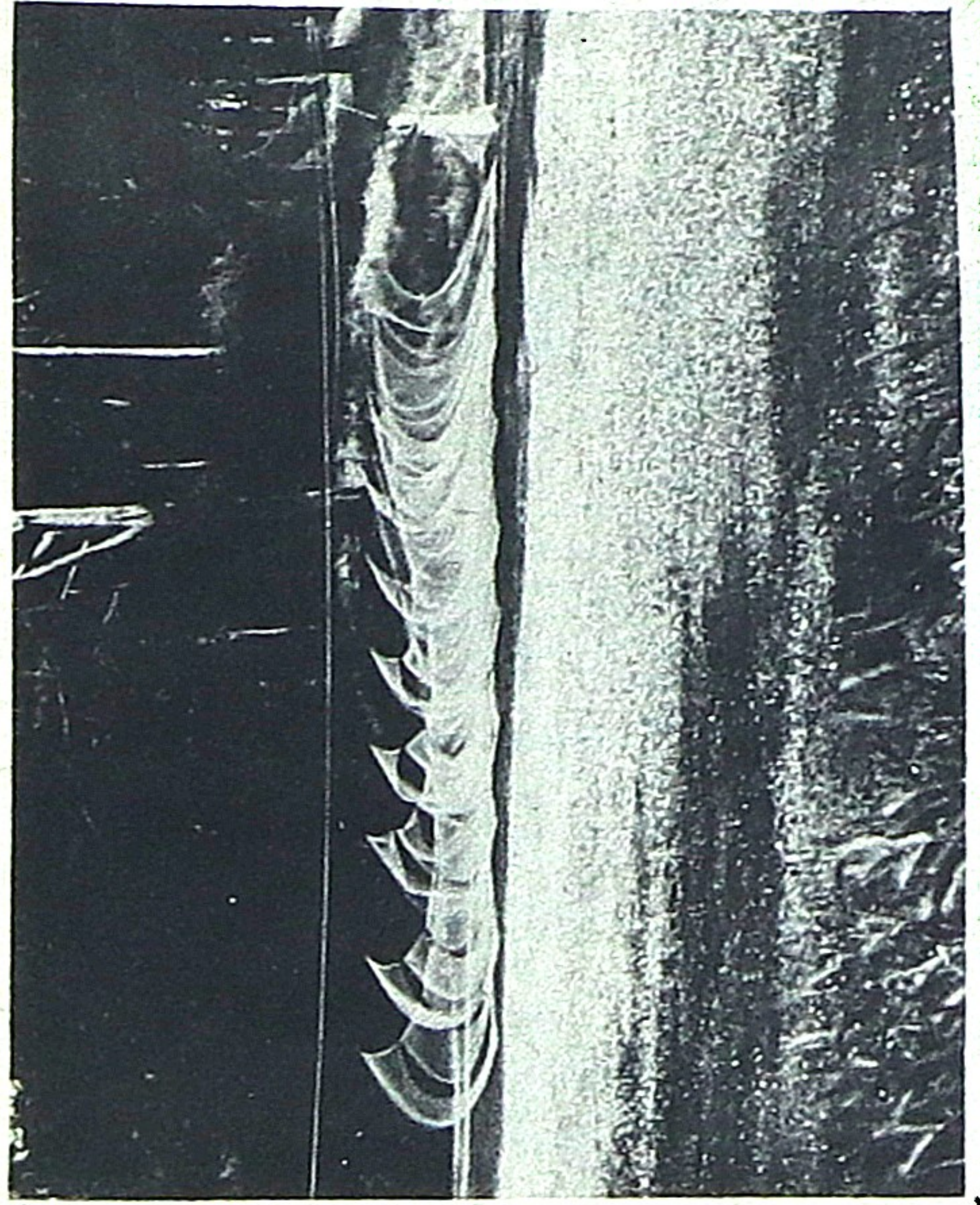
" The purpose of this unit is to set down a complete set of tools for computer graphics utilizing a common approach of matrix mathematics. The material is not intended to be a definitive work, but has two modest goals. First, to set down and illustrate the various mathematical procedures which will permit the novice to quickly become proficient in some of the techniques of computer graphics. Second, to show how these techniques may be implemented on graphic display devices.The only topic treated in the unit is transformation and projection utilizing homogeneous coordinates. Other very important topics have not been included. However, the techniques developed will give a very good first step into the sometimes bewildering arena of computer graphics."

COMPUTER GRAPHICS, THREE DIMENSIONAL PROJECTIONS: Theory, Programs and Examples, Hewlett-Packard Computer Programming Aids, by Herbert D. Peckham, Gavilan College, edited by Christine Doerr, Hewlett - Packard, Hewlett - Packard Company, 11000 Wolfe Road, Cupertino, California 95014

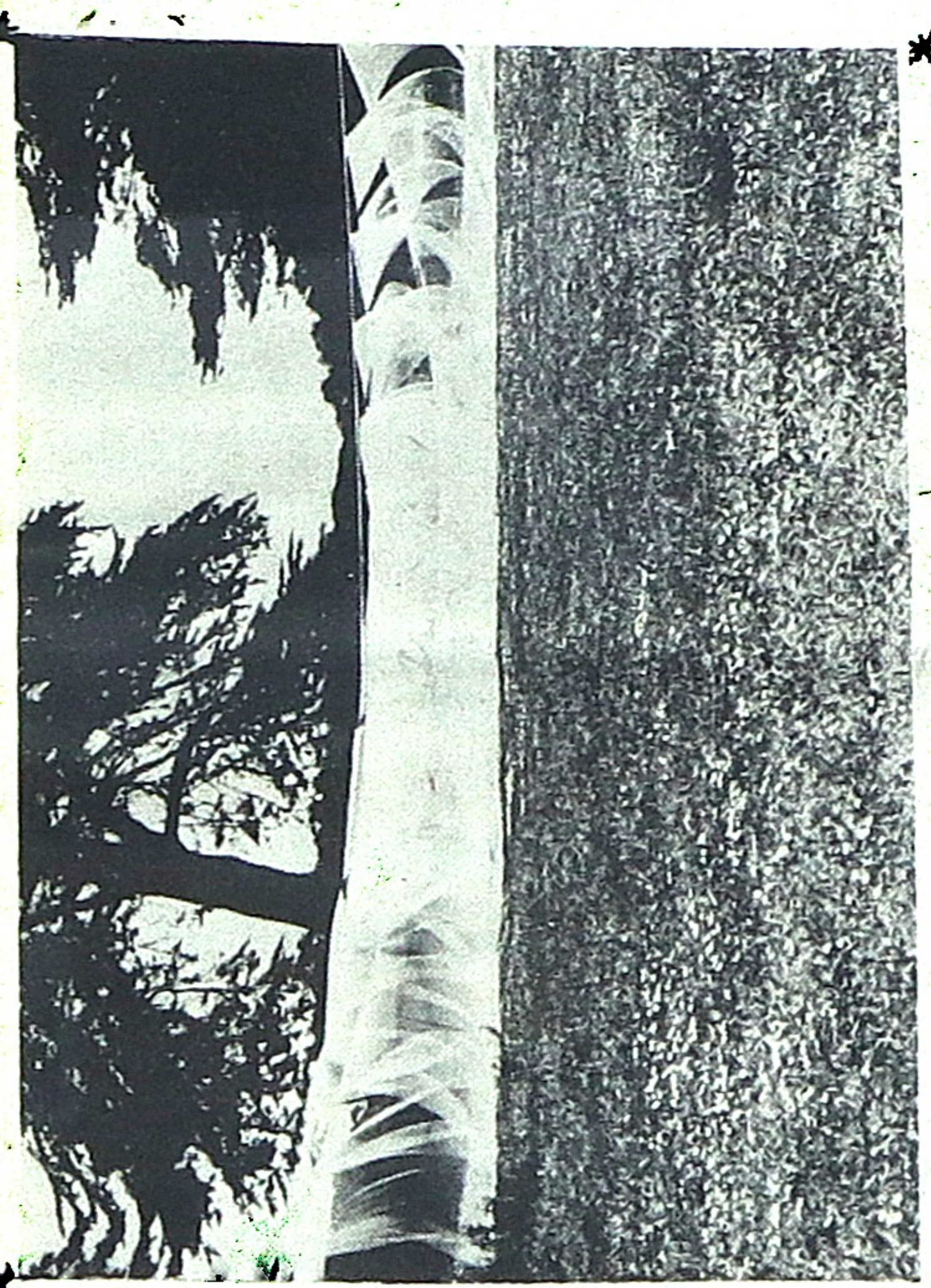
* $1.00 for People's Computer Company Special Art Issue – July, 1974 * * *

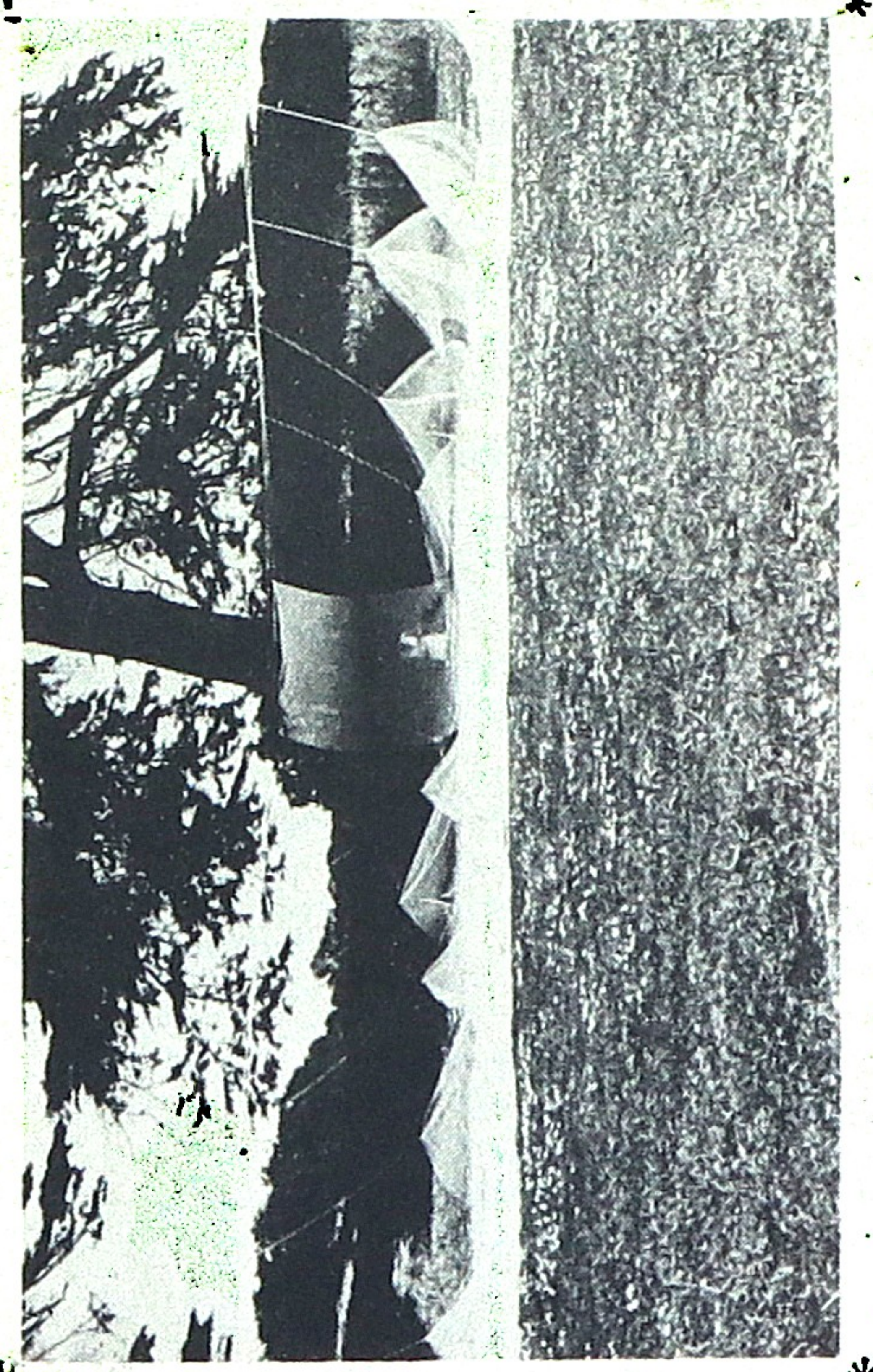
Imagine

a room criss-crossed with multi-colored lazer beams (pastel) As you move thru the space you break the beams such that the room appears to open up to you. It responds to you at exactly the same rhythm and speed with which you move and closes behind you with a slight delay. It is as if you are dancing with your shadow or with the after image or negative space of your own body. Imagine that this can be played back to you so you can see it after you leave the space. Play it again and move back into the space to interact with the visual residue of your own movement.



photos → "Sail Piece"
.... May 21, 1974 ....





I have been building outdoor environmental systems which gently guide the viewer through the space. Each of these systems did interact with a specific outdoor space so as to intensify its essential quality. Participation at this level consisted of being in the space and feeling it all around you - as if it were happening out there somewhere - separate from oneself. Feeling it as a living, breathing space with which one could interact in a dynamic way was minimal.

Last May, I completed a performance piece (Sail Piece) in which I put my body into direct physical interaction with the wind. It became a piece to explore balancing the wind's energy with mine. I was able to feel the gentlest stirring of breezes and later, the full force of the afternoon wind.

It changed my emphasis in a subtle way. I was consciously able to interact with the system and to make aesthetic decisions to determine my actions during the piece. I suddenly became aware that my perception of the piece came from the energy inside of me and not from the energy outside of me and surrounding me. I had built a system which was the visual residue of my feeling about the space and had then interacted with that visual residue in a new way depending upon my feelings aboutt the space. I wanted to make that process available to the viewer.

Presently, my work takes two forms. I design small performance pieces with emphasis on my actions. These are simple, symbolic sets which are analogous for me to interactions with people, spaces, and natural forces. My movement within the physical framework is not pre-determined before the performance. I do what I feel. It is usually quite a powerful experience for me because it depends so much on my state of mind and my feelings about the prescence of the space.

Afterwards, I can look at this new awareness, intellectualize it, name it and relate it to my present and my art.

I then design an environment in which others may have an experiential sense of the quality. There is a lot of freedom for the viewer inherent in this. I am interested in creating spaces in which people can learn more about themselves.

I am experimenting with computer technology because of its capacity for memory. For example, the computer has the ability to remember a person's interaction with the space, the ability to play this memory back to him in a visual way, and the ability to allow him to interact again with this visual residue of his initial action.

My intent is to make these environments simultanously compelling, evocative, and elusive. Since an environment is to be experienced by one person at a time, each individual may bring to this whatever is essential to himself. He may interact with the space in his own unique way thus increasing the impact of the quality which he perceives by changing the space to emphasize his perceptions.

My emphasis is to design environmental systems which are pleasing to my sensibility and which allow a dynamic and creative experience for each person who participates.

Many times I am frustrated by financial and/or technical limitations on my ideas for environments (♥ sigh) so... I have decided to use this space to share them with you conceptually. My intent is to present them as art in idea form — feeling that they will someday appear in an extended form as part of a future environment. I would love any artistic or technical feedback you care to share with me.

* * * * *

This space will also be available from now on to other conceptual artists and artists working with technology who wish to share their ideas and their work in this way.

© Pam Scarvie ~ P.O. Box 310, Menlo Park, Ca. 94025

BULLS & CLEOTS

Sample run

```
You are about to play 'bulls and cleots,' by D. Austin Stephens.

It is a word-guessing game which both you and the computer play
at the same time.  Each side composes a random N-character word.
with no character used more than once.  Then the computer guesses at
your word, you respond, and guess at its word.  It then responds
to your guess.  The responses are the number of bulls and cleots
in the guess.  A bull is a correct character in the correct place, &
a cleot is a character in the wrong place.  For example:"

  NO.       GUESS    RESPONSES"

  ABCD      ABCF      3 BULLS, 0 CLEOTS."
  1234      $:56      0 BULLS, 2 CLEOTS."
  WXYZ      WXYZ      4 BULLS, 0 CLEOTS."

Of course, the one to first guess 'N bulls' is the winner.

Good luck.
Character set?+-*/^()
Number of characters in a word?3

I guess ^*-.
How many bulls and cleots?1,0

What is your guess?+-*
You guessed 0     bulls and 2     cleots.


I guess (*-.
How many bulls and cleots?2,0

What is your guess?*+-
You guessed 2     bulls and 0     cleots.


I guess (/-.
How many bulls and cleots?1,0

What is your guess?*+^
You guessed 1     bulls and 0     cleots.


I guess (*+.
How many bulls and cleots?2,0

What is your guess?*)-
You guessed 1     bulls and 1     cleots.


I guess (*).
How many bulls and cleots?3,0

I win!
My number was +-*.  Again?YES
Do you want a new character set?YES
Character set?123456739
Number of characters in a word?4

I guess 2831.
How many bulls and cleots?1,2

      What is your guess?1234
      You guessed 0     bulls and 1     cleots.


      I guess 5331.
      How many bulls and cleots?1,1

      What is your guess?1567
      You guessed 0     bulls and 1     cleots.


      I guess 2931.
      How many bulls and cleots?1,2

      What is your guess?2567
      You guessed 0     bulls and 1     cleots.


      I guess 2371.
      How many bulls and cleots?0,2

      What is your guess?9814
      You guessed 0     bulls and 3     cleots.


      I guess 2834.
      How many bulls and cleots?2,1

      What is your guess?9817
      You guessed 0     bulls and 2     cleots.


      I guess 2134.
      How many bulls and cleots?2,2

      What is your guess?9842
      You guessed 1     bulls and 2     cleots.


      I guess 1234.
      How many bulls and cleots?4,0

      I win!
      My number was 6948.  Again?NO
```

HP 9830A

By Stephen Bates

BULLS AND CLEOTS was originally written on Hewlett Packard's 9830A Programmable Calculator with Facit typewriter output, which explains the use of lower case characters in the program's PRINT statements. It was later adapted for use with the 2000.

The 9830 is a fantastic machine. For editing, its capabilities are unique. One finds difficulty programming a computer via teletype once he has experienced the joys of automatic line numbering, fetching any line for display in one command, and correcting mistakes in a line in memory without retyping or the use of the awkward back-arrow.

We experienced one problem with it: it uses cassette tapes to store programs and data on. Not just any cassettes, either; Hewlett Packard 310 cassettes. The problem exists when grit lodges on the cassette. Apparently, each time a file is loaded the computer checks a beginning-of-file mark that tells how many words are in the file against the actual number of words it finds when loading it in. If something causes two different numbers to crop up, it's goodbye program. It beeps gently and signals you with an error number; what it all means it that you cannot get that program back from the cassette. For this reason HP urges you to either keep two copies of each cassette or go through a long cleaning program for each cassette.

Back to friendly things about the 30. One nice thing is that memory specifications refer to user available memory only--not software-required memory too. This means that you can do a lot with 3808 words, which we had. Aside from BULLS AND CLEOTS, such programs as CAVES, a version of STTR1, and MARKET fit on the machine.

HP added some marvelous string manipulation statements on the 30. Aside from LEN, POS gives you the position of a given character in a string; VAL gives the value of numeric characters in a string, etc. Unfortunately, you cannot use more than one string in an IF ... THEN statement (as in IF A$=B$ OR B$=C$ THEN 1000).

The 9830 comes all by itself for around $6000. Also available are ROMs for matrix operation, plotter control, string variables, and advanced programming (adds such useful commands as BEEP to the 9830 vocabulary). Paper tape readers are also available, along with card readers, plotters, thermal page printers, and digitizers. Lease price is slightly over $300 a month for the package we used, including memory increment and typewriter, not to mention string variables (almost a necessity).

* * *

Page by D. Austin Stephens

& Stephen Bates

* * *

SORRY: no paper tapes or cassettes available yet. Write us for further information.

Programming

By D. Austin Stephens

Rules for BULLS & CLEOTS

The bulk of the program is that logic needed to have the computer formulate its guess of the human's word. It must be able to deduce the human's word from the changes in the human's responses from turn to turn when only one character is varied. For example: when only one character is varied and the new response lists the number of bulls as one less than the number of bulls from the last turn, the machine knows that the old character in that position was a bull, and that the new character is either a cleot or a null. An increase in the number of cleots indicates that the new character is a cleot, and no change indicates a null. In this case the computer restores the old character, replaces the 0 in A$ with an X to remind itself that that character is a bull, and is not to be touched again for the duration of the program. When comparing the old number of bulls with the new number of bulls and comparing the old number of cleots with the new number of cleots, there are nine possible combinations. Two are contradictions, telling the computer that the human has cheated, and the other seven are valid. Only one is ambigous (no change in either bulls or cleots).

The computer employs few programming devices to meet its aim. It uses push-down stacks to store the characters which it will use in its manipulations, and it uses a string to indicate the status of each character position in the word. An 0 is a null, or undetermined; an X means a bull; and a C indicates a cleot.

Should any person have questions or suggestions, please contact me at Oberon Counseling, Box 877, Pecos, Texas 79772.

A brief description

BULLS AND CLEOTS is a computer game of a somewhat different type than the ordinary computer game. For one thing, it has no matrices, galaxies, or Klingons. For another, it is one of the few games in which the computer is not merely a score-keeper: it is a contestant. Both the human and the computer play against each other, and the computer's only advantage is a better memory.

Now for the rules. The game itself is a more complicated version of BAGELS. Here, however, instead of being given results sounding like pastries and prefixes, you are given the number of bulls and the number of cleots. For the actual rules, see the sample run.

BULLS AND CLEOTS permits the use of words of any length from two characters to twenty. The words are randomly picked from a character set specified at the beginning of the program. This character set may be up to forty characters in length, and consists of any characters on the machine used, the blank included.

Listing

```
LIST

10 DIM A$[20],B$[20],C$[40],A[20],G[20],H[20],Y[40]
20 PRINT "Instructions";
30 INPUT B$
40 IF B$[1,1]#"Y" THEN 250
50 PRINT
60 PRINT "You are about to play 'bulls and cleots,' by D. Austin Stephens."
70 PRINT
80 PRINT "It is a word-guessing game which both you and the computer play"
90 PRINT "at the same time.  Each side composes a random N-character word,"
100 PRINT "with no character used more than once.  Then the computer guesses at"
110 PRINT "your word, you respond, and guess at its word.  It then responds"
120 PRINT "to your guess.  The responses are the number of bulls and cleots"
130 PRINT "in the guess.  A bull is a correct character in the correct place, &"
140 PRINT "a cleot is a character in the wrong place.  For example:"
150 PRINT
160 PRINT "  NO.      GUESS   RESPONSES"
170 PRINT
180 PRINT "  ABCD     ABCF     3 BULLS, 0 CLEOTS."
190 PRINT "  $%34     %$56     0 BULLS, 2 CLEOTS."
200 PRINT "  WXYZ     WXYZ     4 BULLS, 0 CLEOTS."
210 PRINT
220 PRINT "Of course, the one to first guess 'N bulls' is the winner."
230 PRINT
240 PRINT "Good luck."
250 PRINT "Character set";
260 INPUT C$
270 P9=LEN(C$)
280 FOR I=1 TO P9-1
290 FOR J=I+1 TO P9
300 IF C$[I,I]=C$[J,J] THEN 340
310 NEXT J
320 NEXT I
330 GOTO 360
340 PRINT "No character may be used more than once.  Try again."
350 GOTO 250
360 PRINT "Number of characters in a word";
370 INPUT Z
380 IF Z<P9-2 AND Z>2 AND Z=INT(Z) THEN 410
390 PRINT "Try another number."
400 GOTO 360
410 FOR I=1 TO P9
420 P9=LEN(C$)
430 Y[I]=I
440 NEXT I
450 FOR I=P9+1 TO 40
460 Y[I]=-1
470 NEXT I
480 FOR I=1 TO P9
490 A=FNS(P9)
500 B=FNS(P9)
510 T=Y[A]
520 Y[A]=Y[B]
530 Y[B]=T
540 NEXT I
550 FOR I=1 TO Z
560 H[I]=FNS(P9)
570 FOR J=1 TO I-1
580 IF H[I]=H[J] THEN 560
590 NEXT J
600 NEXT I
610 FOR I=1 TO Z
620 GOSUB 810
630 A[I]=N
640 A$[I,I]="O"
650 NEXT I
660 B=C=F=0
670 GOSUB 1340
680 IF B=Z THEN 2120
690 IF B1=Z THEN 2190
700 IF B+C=Z THEN 1690
710 IF B+C=0 THEN 610
720 A=0
730 GOTO 870
740 DEF FNS(X)=1+INT(RND(0)*X)
750 FOR Z8=P9+1 TO 2 STEP -1
760 Y[Z8]=Y[Z8-1]
770 NEXT Z8
780 Y[1]=N
790 P9=P9+1
800 RETURN
810 N=Y[1]
820 FOR Z8=1 TO P9
830 Y[Z8]=Y[Z8+1]
840 NEXT Z8
850 P9=P9-1
860 RETURN
870 A=A+1
880 IF A>Z THEN 720
890 IF A$[A,A]#"O" THEN 870
900 G=A[A]
910 GOSUB 810
920 A[A]=N
930 GOSUB 1340
940 IF B=Z THEN 2120
950 IF B1=Z THEN 2190
960 IF B+C=Z THEN 1690
970 IF B+C=0 THEN 610
980 IF B>BO AND C=CO THEN 1080
990 IF B<BO AND C=CO THEN 1110
1000 IF B=BO AND C<CO THEN 1160
1010 IF B=BO AND C>CO THEN 1200
1020 IF B>BO AND C<CO THEN 1230
1030 IF B<BO AND C>CO THEN 1260
1040 IF B=BO AND C=CO THEN 1300
1050 PRINT "Huh?  Try again."
1060 INPUT B,C
1070 GOTO 940
1080 F=G
1090 GOTO 1140
1100 A[A]=G
1110 F=A[A]
1120 B=B+1
1130 A[A]=G
1140 A$[A,A]="X"
1150 GOTO 870
1160 F=A[A]
1170 A[A]=G
1180 C=C+1
1190 GOTO 1210
1200 F=G
1210 A$[A,A]="C"
1220 GOTO 870
1230 N=G
1240 GOSUB 750
1250 GOTO 1140
1260 N=A[A]
1270 GOSUB 750
1280 A[A]=G
1290 GOTO 1140
1300 Y[P9+1]=A[A]
1310 P9=P9+1
1320 A[A]=G
1330 GOTO 870
1340 PRINT
1350 PRINT "I guess ";
1360 FOR M=1 TO Z
1370 PRINT C$[A[M],A[M]];
1380 NEXT M
1390 PRINT "."
1400 PRINT "How many bulls and cleots";
1410 BO=B
1420 CO=C
1430 INPUT B,C
1440 PRINT
1450 IF B=Z THEN 2120
1460 B1=C1=0
1470 PRINT "What is your guess";
1480 INPUT B$
1490 FOR Q=1 TO Z
1500 FOR K=1 TO LEN(C$)
1510 IF C$[K,K]=B$[Q,Q] THEN 1530
1520 NEXT K
1530 G[Q]=K
1540 NEXT Q
1550 FOR Q=1 TO Z
1560 FOR E=1 TO Z
1570 IF G[Q]#H[E] THEN 1590
1580 C1=C1+1
1590 NEXT E
1600 NEXT Q
1610 FOR Q=1 TO Z
1620 IF H[Q]#G[Q] THEN 164C
1630 B1=B1+1
1640 NEXT Q
1650 C1=C1-B1
1660 PRINT "You guessed";B1;" bulls and";C1;" cleots."
1670 PRINT
1680 RETURN
1690 IF F#0 THEN 1740
1700 F=FNS(LEN(C$))
1710 FOR I=1 TO Z
1720 IF A[I]=F THEN 1700
1730 NEXT I
1740 FOR I=1 TO Z-1
1750 IF A$[I,I]="X" THEN 2100
1760 FOR J=I+1 TO Z
1770 IF A$[J,J]="X" THEN 2090
1780 T=A[I]
1790 A[I]=A[J]
1800 A[J]=T
1810 GOSUB 1340
1820 IF B=Z THEN 2120
1830 IF B1=Z THEN 2190
1840 IF BO+2=B THEN 2040
1850 IF BO+1=B THEN 1900
1860 IF B=BO THEN 2060
1870 T=A[I]
1880 A[I]=A[J]
1890 A[J]=T
1900 R=A[I]
1910 A[I]=F
1920 GOSUB 1340
1930 IF B=Z THEN 1680
1940 IF B1=Z THEN 2190
1950 IF B+1=BO THEN 2000
1960 A[I]=R
1970 B=B+1
1980 A$[J,J]="X"
1990 GOTO 2090
2000 A[I]=R
2010 A$[I,I]="X"
2020 B=B+1
2030 GOTO 2100
2040 A$[J,J]="X"
050 GOTO 2010
2060 T=A[I]
2070 A[I]=A[J]
2080 A[J]=T
2090 NEXT J
2100 NEXT I
2110 GOTO 1740
2120 PRINT "I win!"
2130 PRINT "My number was ";
2140 FOR I=1 TO Z
2150 PRINT C$[I,I];
2160 NEXT I
2170 PRINT ".  Again";
2180 GOTO 2200
2190 PRINT "Some luck.  Again";
2200 INPUT B$
2210 IF B$[1,1]#"Y" THEN 2260
2220 PRINT "Do you want a new character set";
2230 INPUT B$
2240 IF B$[1,1]="Y" THEN 250
2250 GOTO 410
2260 END
```

Write to us!

OBERON COUNSELING

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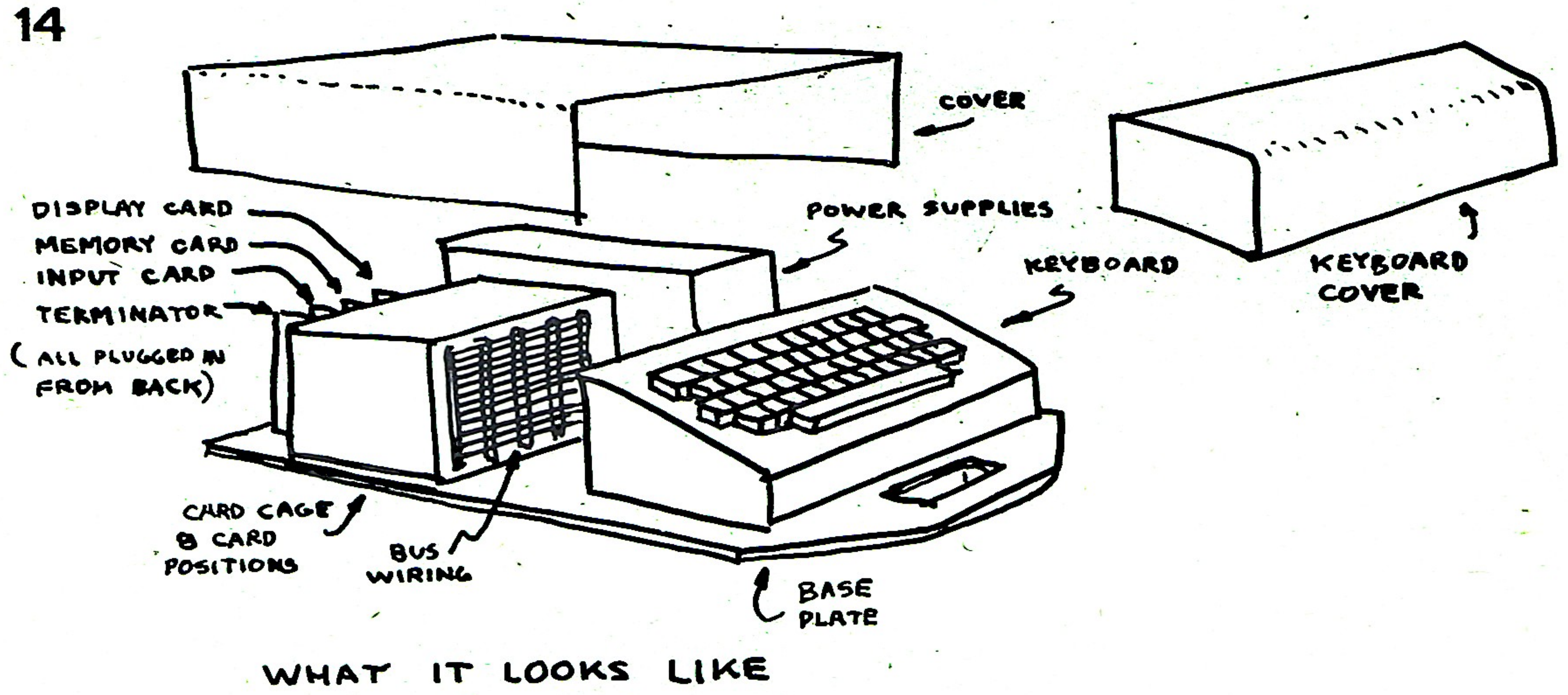
PECOS, TEXAS 79772

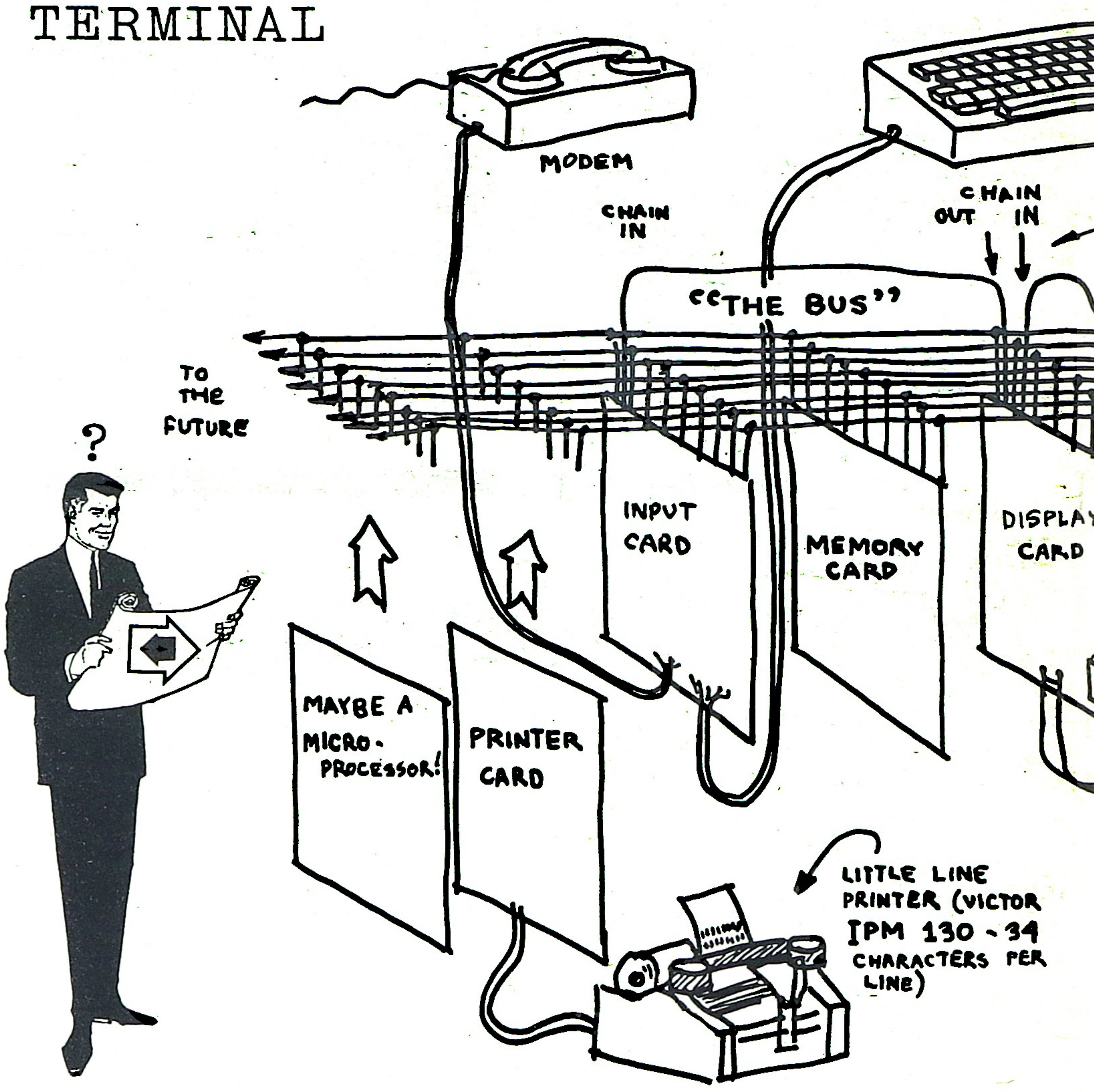


WHAT IT LOOKS LIKE

TOM
SWI
LIVES

BY LEE FELSENSTEIN, LGC

THE TOM SWIFT TERMINAL



Shortly after the Community Memory public-access information retrieval system was put into operation in Berkeley and San Francisco, it became clear that existing terminals would not be sufficient for the operation of an expanded system. Available terminals were either display or printing types, and C.M. needed a combination.

Also, existing terminals are too hard to fix. The motto of the system was "hands on," but the terminals in effect said "hands off " of the equipment. Glitches and quirks of operation were present in the cheaper display terminals which might unnerve an inexperienced user, and this system was being made for inexperienced users.

Armored terminals? Ultra-high reliability? The purpose of C.M. was not to lock people out of the system, but to give them some control over it.

The answer was to design a terminal which could be used as a toy as well as a tool; that electronic enthusiasts could learn and could hook up in various ways. A terminal like that would grow its own service organization. It could also be updated to higher levels of intelligence when Community Memory was ready to deal with smarter, editing terminals.

As the hardware arm of Community Memory, L.G.C. Engineering has developed a preliminary design for this "Tom Swift Terminal" and we are now at work on the manufacturing design. It will be part of the future Community Memory systems and will be offered for sale as well.

As a terminal, it is over-designed, but NOT over-specialized. In fact, the design effort has gone into making it as modular and adaptable as possible. In its minimum form, called the "basic system," it is a box of electronics with a keyboard. It connects to a telephone coupler and to the antenna terminals of a home TV.

You type on the keyboard and the text fills the TV screen, rolling upwards off the screen after the screen is filled. Lines are 32 characters long, and 16 lines fill a screen. After a line has rolled up off the screen, it can be retrieved by causing a "roll down," which can bring back up to 16 past lines. It operates at 30 characters per second, which is about as fast as a non-speed-reader

Now, there's nothing unusual about such operation, except perhaps the "roll down" capability. The fun begins when you want to expand the system to do more.

Open up the case. The electronics are organized on plug-in-printed-circuit boards, with room for lots more. You can plug in a card which connects to a little adding machine printer. Without changing the rest of the device, you can now command (from the keyboard or the computer) the printer to print out a line at a time or a screenful at a time. The printer takes a third of a second to print out one 32 character line.

Plug in another memory card (the system comes with one) and you will be able to retrieve up to 48 unseen lines or data. The thing is made for plug-ins. Each card plugged in has full access to all the information in the system, and can control the whole thing if properly designed.

And the terminal comes with enough information so that your local Tom Swift can start building plug-ins. If he can't quite make it, we'll be serving as a clearing house for users who can help other users. Nothing will be marked "proprietary circuitry- return to the manufacturers for service."

As the Community Memory system develops, we will be producing updates of the circuit cards which control the device's editing capability and "intelligence." But we expect to be beaten out by electronic enthusiasts who will recognize the device as a natural seed-bed for testing and developing micro-computers.

"Micros" are computers built around physically tiny but electronically, powerful "microprocessor" integrated-circuit chips, similiar to those which are the guts of pocket calculators.

These chips have been industrially available for a few years now, and are not used by amateur electronics buffs because of the complex additional circuitry they require for operation. Memory, input/output, terminals, etc.

This device is specifically designed to provide such support functions for these microprocessors. Not only that, but in a home environment (TV set required) and in a relatively clean, quiet manner

OUR MOTTO:

IF

WORK

IS TO BECOME

PLAY

THEN

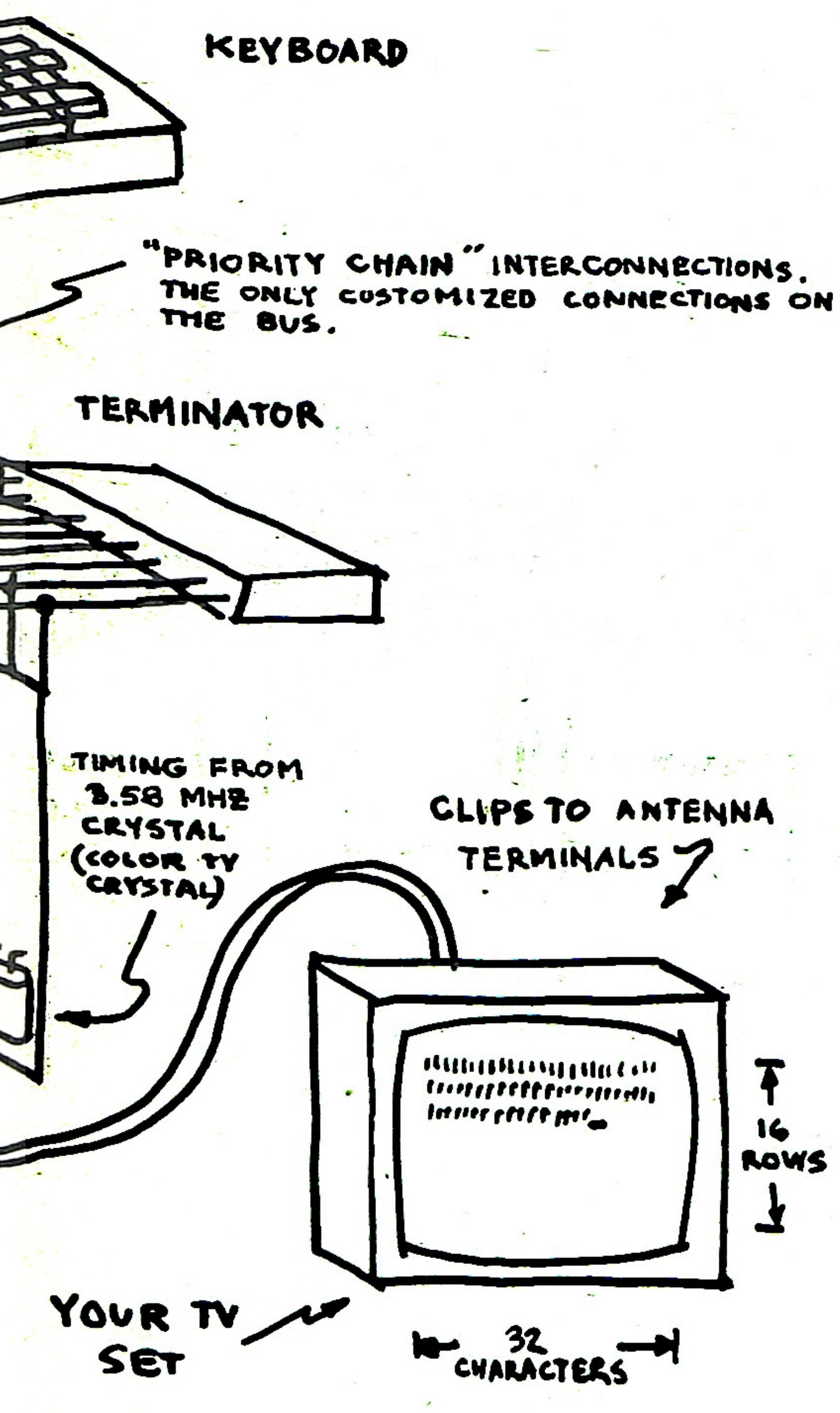
TOOLS

MUST BECOME

TOYS

T
S!

ngineering


KEYBOARD
"PRIORITY CHAIN" INTERCONNECTIONS. THE ONLY CUSTOMIZED CONNECTIONS ON THE BUS.
TERMINATOR
TIMING FROM 3.58 MHZ CRYSTAL (COLOR TV CRYSTAL)
CLIPS TO ANTENNA TERMINALS
16 ROWS
YOUR TV SET
32 CHARACTERS

WHAT IT IS

hich makes for toys which parents
ke.

"Don't bother Suzie; she's playing ith her computer."

"Toy" should not be seen as a ut-down term. One of these de-
ces can support a micro-computer
ipable of running an entire Community
emory system (of course, the disc
orage units would be physically huge
ompared with the micro.)

"Toy" implies that the device
as uses on many different levels,
l of which are well under control
f the user and which add to the user's
eneral enjoyment, understanding or
ell-being.

For more information on this de-
ce, its design philosophy and operation,
e have a 25 page discussion avail-
ole for 50 cents. Write to L.G.C.
ngineering, 1807 Delaware Street,
erkeley, Ca. 94703.

convivial design

(design so that the user controls the tool, and not the reverse)

One of my engineering professors once asked what was the difference between engineers and scientists. No one answered. The prof drew a dollar sign on the blackboard. "It'll make you or break you," he said reverently.

It's becoming obvious these days that the dollar sign isn't quite where it's at. You won't be able to buy a new world when this one is used up. And design in pursuit of the dollar is busy chewing up not only our physical world, but also our ways of working with our tools and with each other.

I learned electronics as a kid by messing around with old radios. Vacuum-tube radios, which are easy to tamper with because they're designed to be fixed. I made radios into intercom amplifiers, oscillators and transmitters before I knew how to design anything. I stripped radios down to the bare metal, sorted and tested the parts, and built new things from these parts.

Then transistor radios took over the field. They were cheaper to produce, smaller, portable, and didn't need repair as often. So in the interest of the dollar sign, they were made so that you couldn't understand what was in them, couldn't do anything about it if you did understand it (the printed circuit boards would come to pieces if you melted the solder,) and couldn't use parts from one radio in other circuits.

Kids were walking around with transistor radios all the time but with no reason or opportunity to pry into them and learn what made them work. Now the first wave of these kids are grown up and the electronics industry has a shortage of technicians.

Progress? For who? Even the industry suffers. And they have the gall to moan about how people don't appreciate what they're doing for them! But they won't do anything differently , because that is the industrial way of doing things.

Well, there are different ways of doing things, even for engineers. Before there was an industrial system, people were building tools that other people could use without much training. Tools that people could use and which would not use them. People could understand how the tools worked, how to fix them when they broke, and how to alter them when the job changed.

There's no reason why even the most complex tools in use today can't be handled the same way. P.C.C. is showing how computer software can handled in this convivial fashion.

(I will use the term "convivial" to refer to this "non-industrial" type of design for tools and systems. The term is from the book," Tools For Conviviality" by Ivan Illich, Harper and Row, 1971, which first laid out this approach to the problem.)

And as a computer hardware designer, I believe that computer hardware can also be designed and handled in a convivial fashion. My own effort is the Tom Swift Terminal, described elsewhere. But aside from plugging my own products, I want to use this space to open up communication among those of us who are working on convivial design for whatever application.

Letters, project descriptions, intelligent suggestions, requests for help and offers of help can be sent to P.C.C. and I'll try to keep them straight. We'll see if we can use this page as an information exchange until the need outgrows it.

Lee Felsenstein

COMMERCIAL

LGC Engineering is offering low-speed modem circuit cards compatable with Bell 103 standards. They are intended for full or half duplex operation at 75 to 300 Baud. They use phase-locked loop frequency-shift detectors with a unique self-adjusting reference circuit which is constantly re-calibrating itself.

Minimum input level is -46 dbm, input impedance is 33kohm. Output level into 900 ohms is adjustable from +6 dbm to -20 dbm. An electronic hybrid circuit is included on the card so that the Bell CBT coupler or equivalent can be driven without additional components.

Power required is +18 volts, −18 volts unregulated, 2vpp maximum ripple. A suggested power supply circuit is provided. EIA RS−232 data input and output is included, as well as 20 ma current loop input and output. EIA carrier detect output and drive for two parallel back-to-back LED indicators is also provided.

An optional auto-answer circuit for use with CBT couplers is available. The modem is constructed on a 4.5 X 6.5 inch printed circuit card and connects to a 44-pin edge connector, Vector R644 or equivalent.

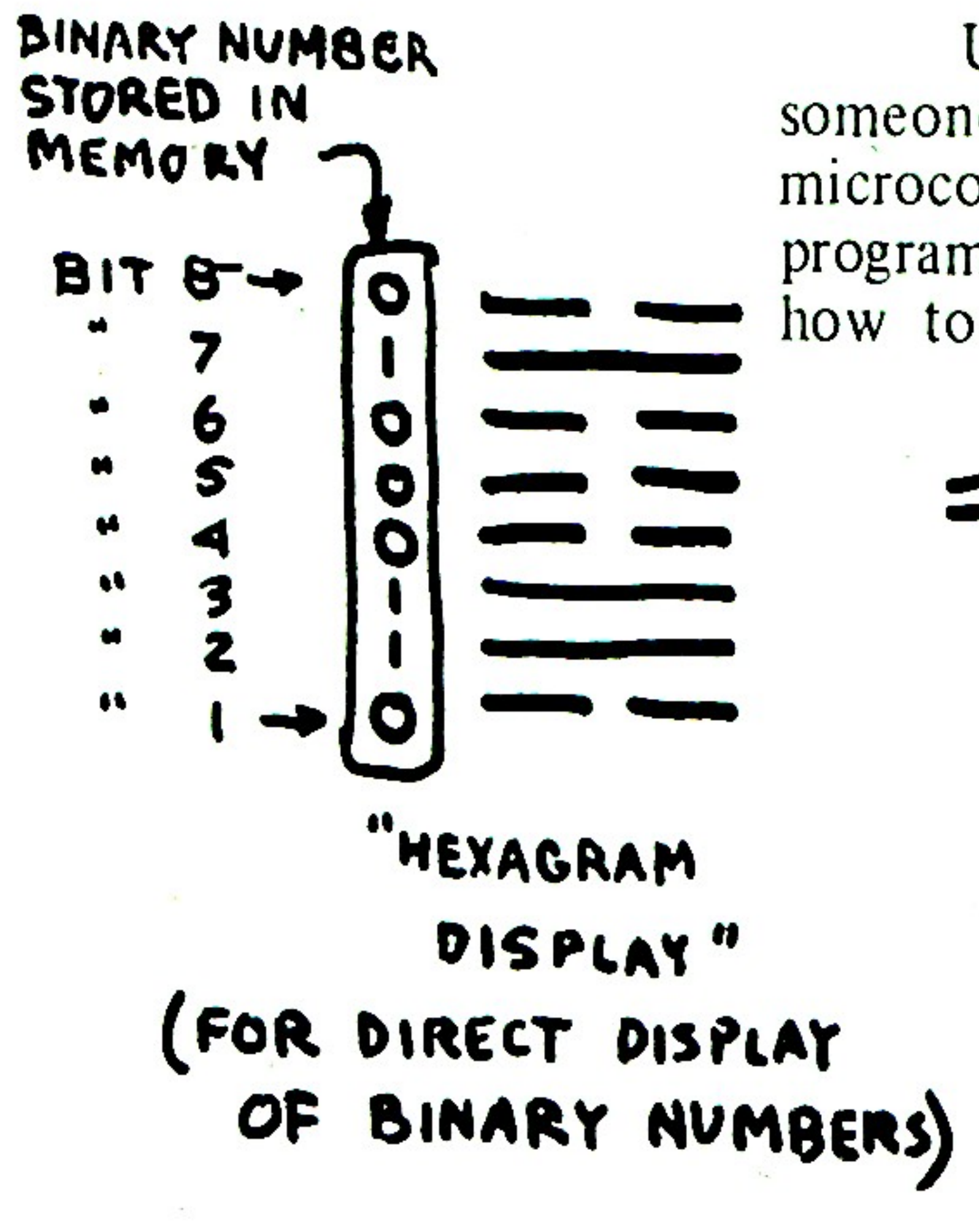
Price is $150 plain, $175 with auto-answer. Specify originate or answer mode. Further information available from LGC Engineering, 1807 Delaware St., Berkeley, CA 94703

We're also designing a microprogrammed multi-line serial-line multiplexer (for handling up to 256 teletype lines). If you need one and have some money, let us know.

also;

The Tom Swift Terminal is able to display the direct binary contents of its memory as well as the letters and numbers represented by those binary numbers.

For example, the letter "H" is represented by the binary 01000110. If a switch is thrown the terminal displays the number as a stack of solid or broken lines in the space where the "H" had been displayed. Solid lines represent "1", broken lines represent "0". The bottom line on the stack is the right-hand digit of the binary number, the least significant digit.



"HEXAGRAM DISPLAY"
(FOR DIRECT DISPLAY OF BINARY NUMBERS)

Using this "hexagram display", someone using the terminal with a microcomputer can examine the program code without even knowing how to read.

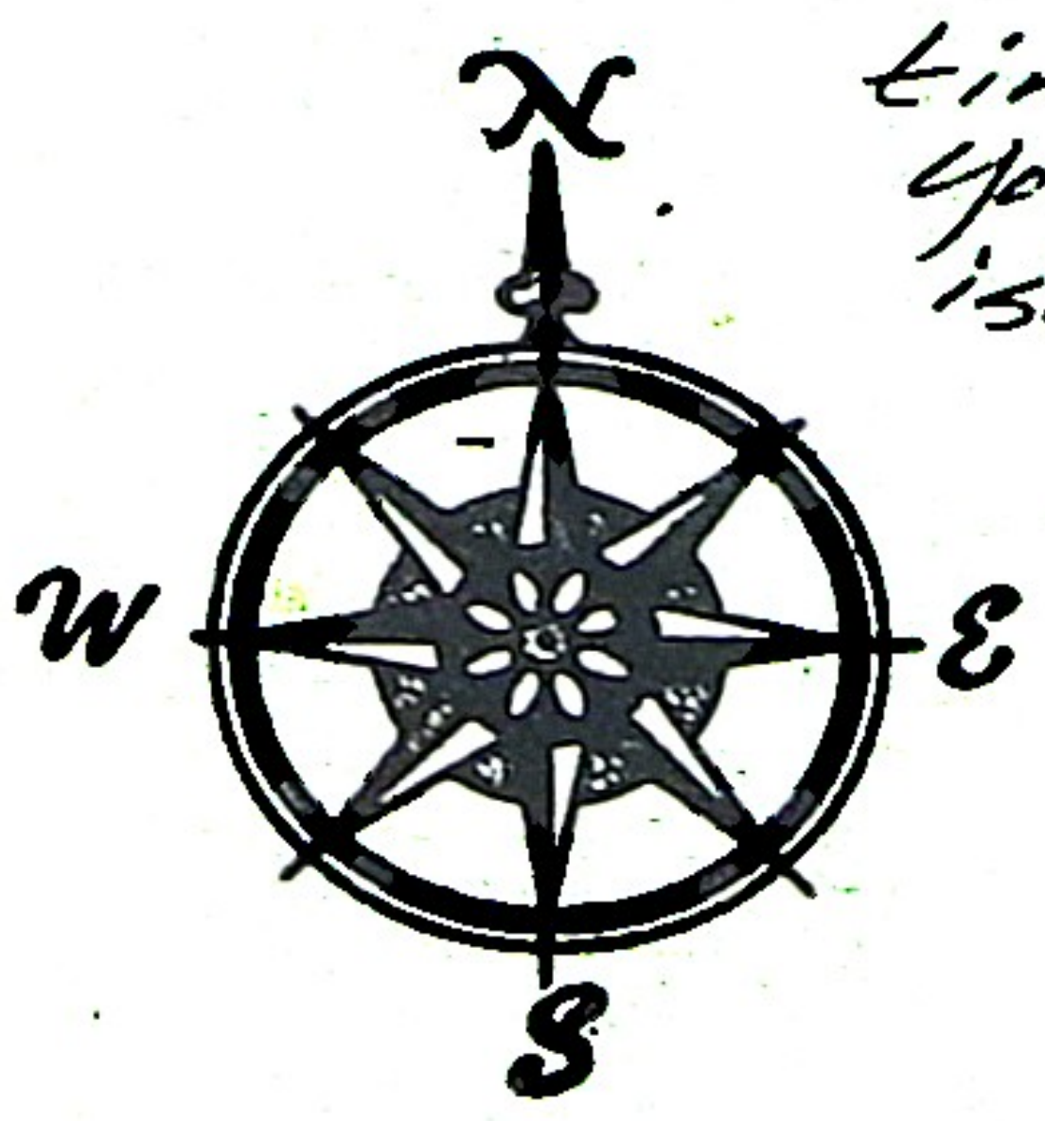
ASCII DISPLAY
(USING CHARACTER GENERATOR)

The Further Adventures of * * *

INCHWORM

by Bob

INCHWORM, as you may recall from last time, lives on an island. And he is computerized. You can program him to move around the island, one square at a time.

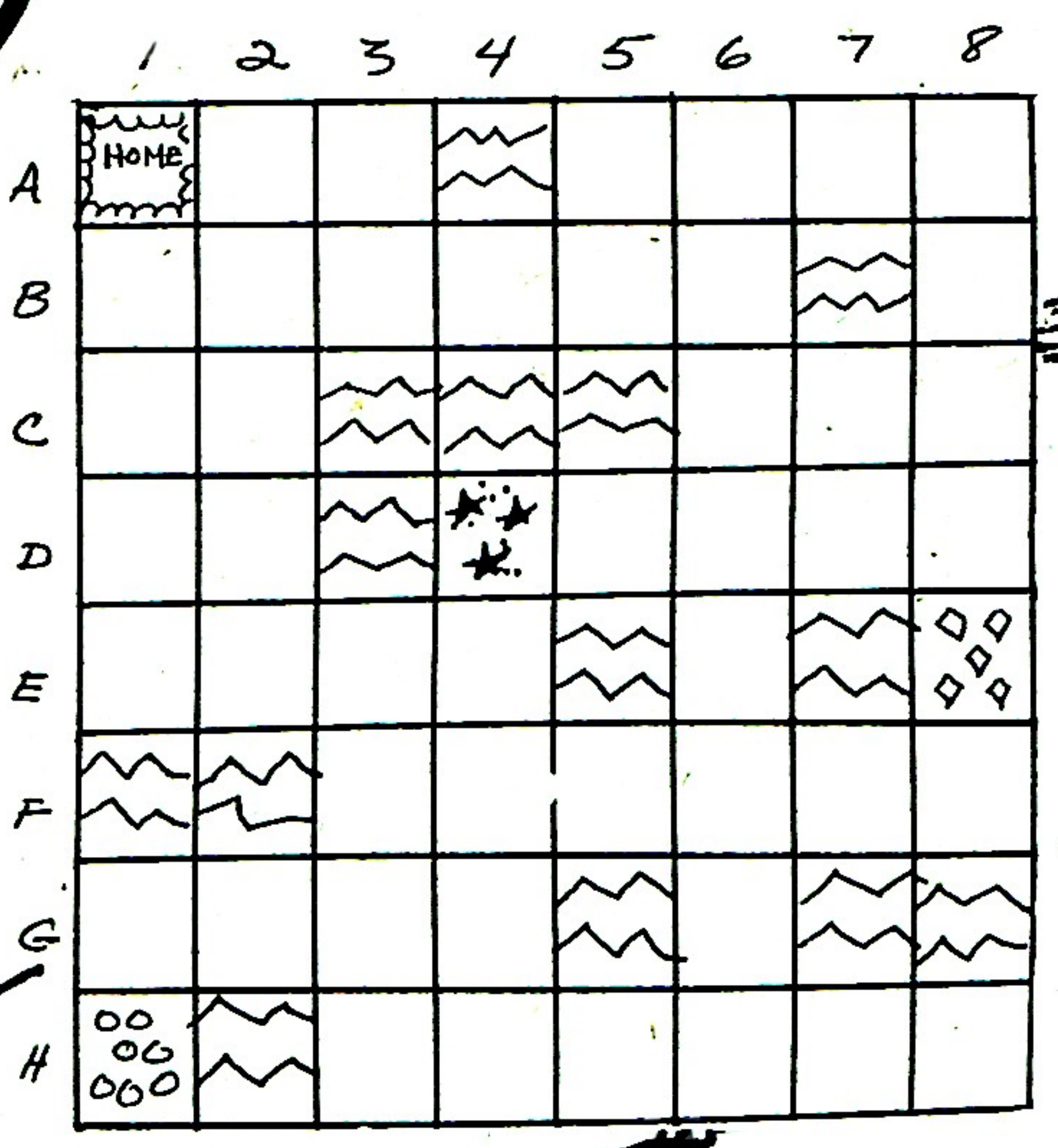


To tell him to move one square NORTH, write N
To tell him to move one square EAST, write E
To tell him to move one square SOUTH, write S
To tell him to move one square WEST, write W

"INCHWORM" by Will Scarvie (8)

Well, since last time, volcanoes have been erupting and now there are mountains on INCHWORM'S island. INCHWORM cannot go into or through a square that has a mountain.

Mountains look like this ≋



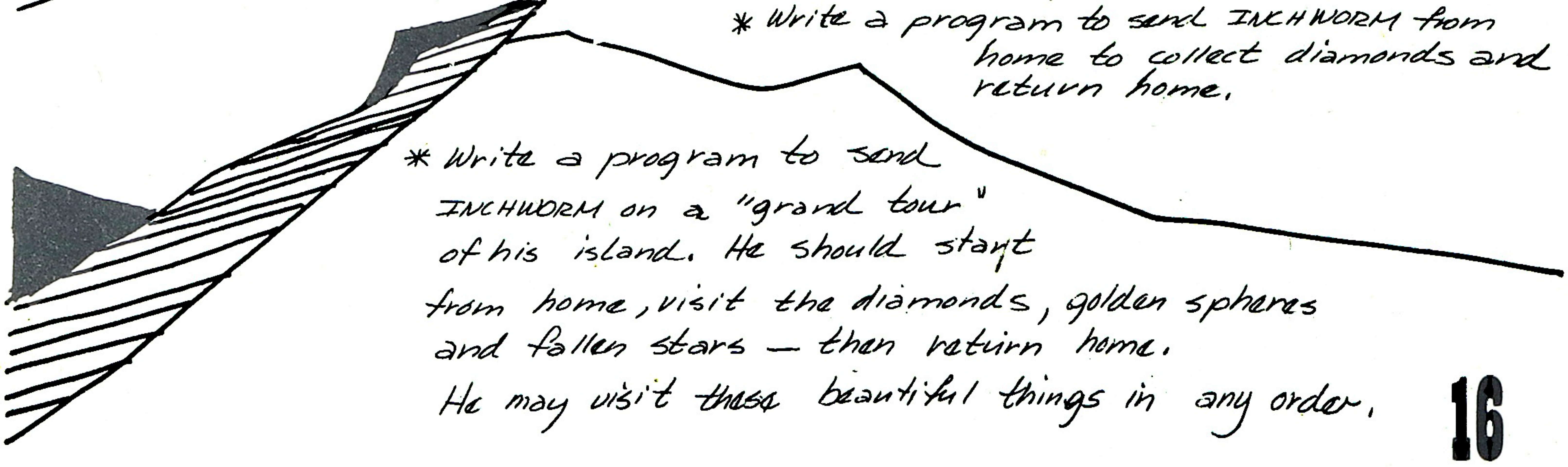
	1	2	3	4	5	6	7	8
A	HOME			≋				
B							≋	
C			≋	≋	≋			
D			≋	★★★				
E					≋		≋	◇◇◇
F	≋	≋						
G					≋		≋	≋
H	○○○	≋						

Behold the island! Mountains is squares A4, B7, C3, C4 and so on. Also ... fallen stars in square D4, diamonds in E8 and golden spheres in H1.

Here is a program to send INCHWORM from home (A1) to visit the fallen stars and return home.

PROGRAM* SSSSEEENEENNWWWWWN

- * Trace INCHWORMS path as he follows the program.
- * Write a program to send INCHWORM from home to collect diamonds and return home.

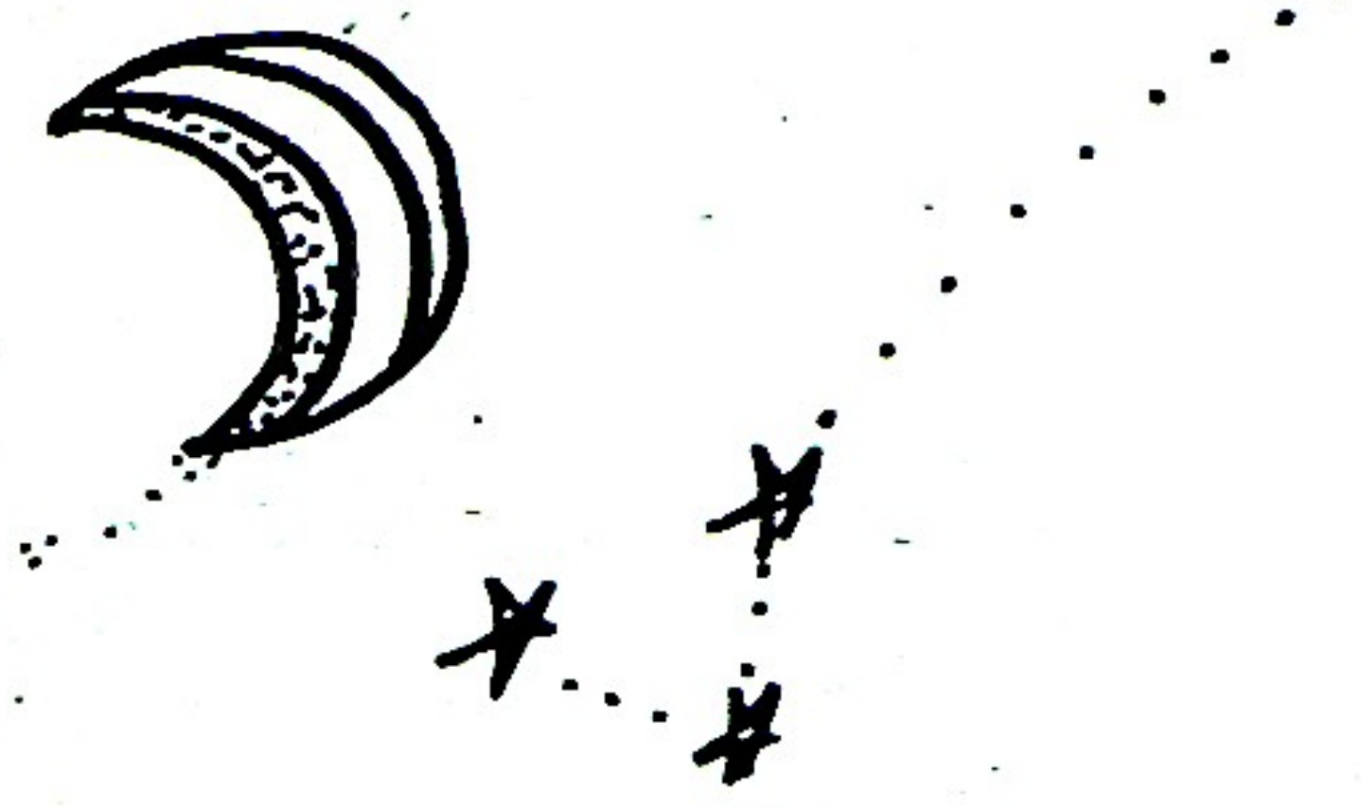


* Write a program to send INCHWORM on a "grand tour" of his island. He should start from home, visit the diamonds, golden spheres and fallen stars — then return home. He may visit these beautiful things in any order.

INCHWORM is visiting a strange island. Each square, except A1 and H8, has a number in it, a 0 or a 1 or a 2. We wrote the following program to get INCHWORM from HERE (square A1) to THERE (square H8.)

SESESESE SESESE

Then we added the numbers in the squares that INCHWORM traveled through in going from HERE to THERE. We got 15 for the sum (what do *you* get?)



* Write a program to get INCHWORM from HERE to THERE so that the numbers in the squares he goes through add up to 16.

Write a program to get INCHWORM from HERE to THERE, Then ask someone else to add up the numbers in the path.

1	2	3	4	5	6	7	8
HERE	2	2	1	2	2	1	1
2	1	0	1	0	2	0	2
2	2	1	1	2	0	1	1
0	1	0	1	0	1	0	0
2	2	0	0	1	2	2	1
0	2	2	0	2	2	1	0
1	1	0	0	0	2	1	2
1	0	2	2	1	0	0	THERE

Pick your own number and find a path that adds up to that number.

* Find the minimum path. The minimum path is the one with the smallest sum. For example, if INCHWORM follows the program below, the sum will be only 6.

PROGRAM* SSSEESESSESEEE

Can you find a path with a smaller sum?

* You can always get INCHWORM from HERE to THERE in 14 program steps. For example.

$$\text{PROGRAM*}\ \underbrace{\text{EEESSSEEEESSSS}}_{\text{14 steps}}$$

The sum for the above path is 12.

Can you find the maximum path for which the program is exactly 14 steps? Maximum path? That's the path (with exactly 14 steps in the program) for which the sum is the largest, We know of one path with a sum of 19.❤

REWARD

Send us an INCHWORM game, activity or idea. If we publish it, we will give you a free subscription to P.C.C. and send you a bunch of copies of the issue your ideas appeared in.

❤MAYBE it is the maximum path, maybe NOT.

GREGORY BATESON

Reprinted with permission of the *Whole Earth Epilog*, First Edition
September, 1974.

Steps to an Ecology of Mind

Where the insights of Buckminster Fuller initiated the **Whole Earth Catalog**, *Gregory Bateson's insights lurk behind most of what's going on in this* **Epilog**.

Through him I became convinced that much more of whole systems could be understood than I thought, and that much more existed wholesomely beyond understanding than I thought—— that mysticism, mood, ignorance, and paradox could be rigorous, for instance, and that the most potent tool for grasping these essences—— these influence nets—— is cybernetics.

Bateson is responsible for a number of formal discoveries, most notably the "Double Bind" theory of schizophrenia. As an anthropologist he did pioneer work in New Guinea and (with Margaret Mead) in Bali. He participated in the Macy Foundation meetings that founded the science of cybernetics but kept a healthy distance from computers. He has wandered thornily in and out of various disciplines—— biology, ethnology, linguistics, epistemology, psychotherapy—— and left each of them altered with his passage.

This book chronicles the journey. It is a collection of all his major papers, 1935-1971. In recommending the book I've learned to suggest that it be read backwards. Read the recent broad analyses of mind and ecology at the end of the book and then work back to see where the premises come from.

In my view Bateson's special contribution to cybernetics is in exploring its second, more difficult realm (where the first is feedback, a process influencing itself, what Bateson calls "circuit"; and the second is the meta-realm of hierarchic levels, the domain of context, of paradox and abundant pathology, and of learning.)

Strong medicine.

—SB

Steps to an Ecology of Mind
Gregory Bateson
1972; 517pp
$1.95 postpaid
from:
Ballantine Books, Inc.
201 E. 50th St.
New York, NY 10022
or PCC Bookstore

No organism can afford to be conscious of matters with which it could deal at unconscious levels.

●

Mere purposive rationality unaided by such phenomena as art, religion, dream, and the like, is necessarily pathogenic and destructive of life; its virulence springs specifically from the circumstance that life depends upon interlocking *circuits* of contingency, while consciousness can only see such short arcs as human purpose may direct.

●

The social scene is nowadays characterized by the existence of a large number of self-maximizing entities which, in law, have something like the status of 'persons'—— trusts, companies, political parties, unions, commerical and financial agencies, nations, and the like. In biological fact, these entities are precisely *not* persons and are not even aggregates of whole persons. They are aggregates of *parts* of persons.

●

They say that power corrupts; but this, I suspect, is nonsense. What is true is that the *idea of power* corrupts.

●

(My father, the geneticist William Bateson, used to read us passages of the Bible at breakfast—— lest we grow up to be *empty-headed* atheists.)

●

In no system which shows mental characteristics can any part have unilateral control over the whole. In other words, *the mental characteristics of the system are immanent, not in some part, but in the system as a whole.*

●

The Theology of Alcoholics Anonymous

Some outstanding points of the theology of AA are:

(1) *There is a Power greater than the self.* Cybernetics would go somewhat further and recognize that the "self" as ordinarily understood is only a small part of a much larger trial-and-error system which does the thinking, acting, and deciding. This system includes all the informational pathways which are relevant at any given moment to any given decision. The "self" is a false reification of an improperly delimited part of this much larger field of interlocking processes.

Gregory Bateson

●

But what about "me"? Suppose I am a blind man, and I use a stick. I go tap, tap, tap. Where do *I* start? Is my mental system bounded at the handle of the stick? Is it bounded by my skin? Does it start halfway up the stick? Does it start at the tip of the stick? But these are nonsense questions. The stick is a pathway along which transforms of difference are being transmitted. The way to delineate the system is to draw the limiting line in such a way that you do not cut any of these pathways in ways which leave things inexplicable. If what you are trying to explain is a given piece of behavior, such as the locomotion of the blind man, then, for this purpose, you will need the street, the stick, the man; the street, the stick, and so on, round and round.

●

If you put God outside and set him vis-a-vis his creation and if you have the idea that you are created in his image, you will logically and naturally see yourself as outside and against the things around you. And as you arrogate all mind to yourself, you will see the world around you as mindless and therefore not entitled to moral or ethical consideration. The environment will seem to be yours to exploit. Your survival unit will be you and your folks or conspecifics against the environment of other social units, other races and the brutes and vegetables.

If this is your estimate of your relation to nature *and you have an advanced technology*, your likelihood of survival will be that of a snowball in hell. You will die either of the toxic by-products of your own hate, or simply, of overpopulation and overgrazing. The raw materials of the world are finite.

●

When you narrow down your epistemology and act on the premise "What interests me is me, or my organization, or my species," you chop off consideration of other loops of the loop structure. You decide that you want to get rid of the by-products of human life and that Lake Erie will be a good place to put them. You forget that the ecomental system called Lake Erie is a part of *your* wider ecomental system—— and that if Lake Erie is driven insane, its insanity is incorporated in the larger system of *your* thought and experience.

●

It is rather unusual to find that any feature of a biological system is at all directly determined by the need which it fulfills. Eating is governed by appetite, habit, and social convention rather than by hunger, and respiration is governed by CO_2 excess rather than by oxygen lack. And so on.

In contrast, the products of human planners and engineers are constructed to meet specified needs in a much more direct manner, and are correspondingly less viable. The multiple causes of eating are likely to ensure the performance of this necessary act under a large variety of circumstances and stresses whereas, if eating was controlled only by hypoglycaemia, any disturbance of the single pathway of control would result in death. Essential biological functions are not controlled by lethal variables, and planners will do well to note this fact.

●

D: What is a cliché, Daddy?
F: A cliché? It's a French word, and I think it was originally a printer's word. When they print a sentence they have to take the separate letters and put them one by one into a sort of grooved stick to spell out the sentence. But for words and sentences which people use often, the printer keeps little sticks of letters ready-made up. And these ready-made sentences are called clichés.

●

F: Let's go back to the question which you asked and which I said was too difficult to answer today. We were talking about the printer breaking up his clichés, and you said that he would still keep some sort of order among his letters—— to keep from going mad. And then you asked "What sort of order should we cling to so that when we get into a muddle we do not go mad?" It seems to me that the "rules" of the game is only another name for that sort of order.

D: Yes—— and cheating is what gets us into muddles.

F: In a sense, yes. That's right. Except that the whole point of the game is that we do get into muddles, and do come out on the other side, and if there were no muddles our "game" would be like canasta or chess—— and that is not how we want it to be.

D: Is it *you* that make the rules, Daddy? Is that fair?

F: That, daughter, is a dirty crack. And probably an unfair one. But let me accept it at face value. Yes, it is I who make the rules—— after all, I do not want us to go mad.

D: All right. But, Daddy, do you also change the rules? Sometimes?

F: Hmm, another dirty crack. Yes, daughter, I change them constantly. Not all of them, but some of them.

D: I wish you'd tell me when you're going to change them!

F: Hmm—— yes—— again. I wish I could. But it isn't like that. If it were like chess or canasta, I could tell you the rules, and we could, if we wanted to, stop playing and discuss the rules. And then we could start a new game with the new rules. But what rules would hold us between the two games? While we were discussing the rules?

D: I don't understand.

F: Yes. The point is that the purpose of these conversations is to discover the "rules." It's like life—— a game whose purpose is to discover the rules, which rules are always changing and always undiscoverable.

D: But I don't call that a *game*, Daddy.

F: Perhaps not. I would call it a game, or at any rate "play." But it certainly is not like chess or canasta. It's more like what kittens and puppies do. Perhaps. I don't know.

•••

D: Daddy, why do kittens and puppies play?

F: I don't know—— I don't know.

A Third Chameleon-hypothesis

"What color is a chameleon on a mirror?"

I asked the question of Gregory Bateson at a point in our interview when we were lost in contemplation of the function, if any, of consciousness—— self-consciousness. Both of us being biologists, we swerved to follow the elusive chameleon. Gregory asserted that the creature would settle at a middle value in its color range. I insisted that the poor beast trying to disappear in a universe of itself would endlessly cycle through a number of its disguises.

Now hear the hypothesis of Gerald Hall, student of Gregory's at Santa Cruz, author of the following book review, and proponent of G. Spencer Brown's **Laws of Form** *(which denotes but two basic systems—— ones which remember and ones which oscillate):*

"The chameleon will stay whatever color he was at the moment he entered the mirror domain."

—SB

AFIPS

MONTVALE, N.J., May 22, 1974 — The Second World Conference on Computers in Education sponsored by the International Federation for Information Processing will be held in Marseille, France, September 1—5, 1975. A Call for Papers for this Conference has been issued, requesting that potential participants indicate their intention to submit papers prior to July 15, 1974.

The Conference aims to bring together people concerned with the many possible roles of information technology in education. As a result of the first Conference, it was decided that there is a necessary distinction to be made between the methodology of information processing and the computer, and special attention was called to the considerable advantages to be obtained by introducing the methodology of information processing into the teaching of all disciplines.

To show the progress made to date in this direction and in an attempt to gain new insight for the future, a significant part of the Conference program will be devoted to the introduction of the variety of data processing techniques used in the teaching of different disciplines. Another aim of the Conference will be a consideration of methods and applications of computers to aid in the solution of education in developing countries.

Papers are invited covering the following specific topics:

The Subjects of the conference are:

- Information Processing
- Mathematics
- Natural Sciences - Physics, Chemistry, Biology
- Social and Behavioral Sciences
- Management
- Liberal Arts
- Engineering and Technical Applications

The intention to submit a paper for this conference should be sent to:

Monsieur J. Hebenstreit
Chairman of the Program Committee
Ecole Superieure d'Electricité
10, Avenue Pierre - Larousse
92240 Malakoff France

A formal copy of the call for papers is available from the American Federation of Information Processing Societies, 210 Summit Avenue, Montvale, NJ 07645. AFIPS is the United States representative organization to the International Federation for Information Processing.

DATAMATION

Of many magazine and newspaper sources of computer information, Datamation might not be thought to be of much interest to games buffs or those in education, since it is very definitely oriented to the professional industrial and business users, but it has much to recommend it, most particularly its thoughtful commentaries and analysis on the interactions of computers and people, business and society.

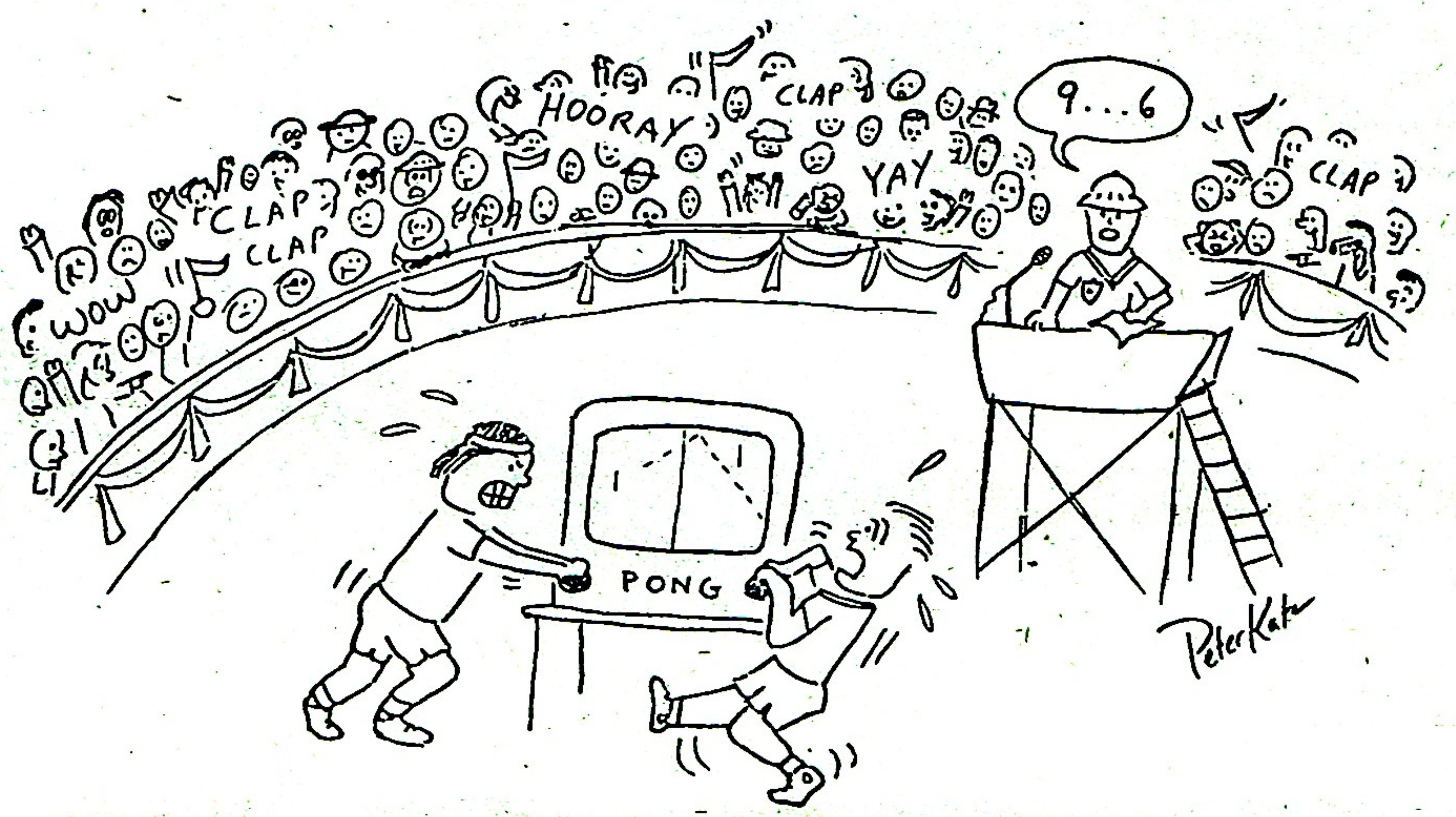
These range from sardonic comments on the facets of the Jolly Green Giant's bland smile to acute analysis of bank tellers' psychological reactions to CRT terminals. Aspects of programming languages are a recurrent subject, interesting and often useful for those using them, fascinating generally for their sidelights on the implications of semantics on structures in machine and human reasoning. Data processors, while usually sensitive to subtle shades of meaning and comparatively precise and orderly in thought, are often seriously inarticulate as a group. Datamation is remarkable in its genre for the quality of its articles, which maintain a well-judged balance between text dense enough in content to exercise minds and writing popular enough to hold the attention of even the layman. Even humor is occasionally discernable while the advertisements, are so well done as to be interesting reading in themselves and for those to whom the remark will have meaning — readers of the New Scientist will feel right at home.

HOME COMPUTING

a hardware status report

In a previous issue (Vol. 3, No. 1) you had the chance to read a fantasy about a future People's Computer Center with sound, smell, etc. This article is a little less fantasy-oriented. Rather, it tries to bring together a series of events, rumors, and happenings in one article and let you draw your own conclusions.

It all started two years ago when Magnavox, the TV poeple, introduced the *Oddysey* game for the low price of $100. You plug this device into any TV and use your screen to play games. *Oddysey* consists of a few mysterious parts and a bunch of printed circuit cards, each one activating one game. The set includes plastic overlays to attach to your screen to make the game more interesting. Many of the original 12 games were derivations of Pong. Others were "contrived", but for $100, it was a great POWER TRIP to take over control of my idiot box. That's really what *Oddysey* is all about. It gives YOU control over your TV (what a switch) . . . to play games . . . and new games are easy to add, just buy the new PC card and overlay.



Along came Digi-log with a keyboard and acoustic coupler that you can connect to any TV set. Then, dial-up your local time sharing system and play Star Trek in the comfort of your own home on your own TV. Only problem was the Digi-log keyboard costs $1195 or so . . . but it does work on any TV. And, then we read, in *Radio and Electronics News* (September 1973) about how to make your own keyboard-TV terminal for around $200. We discovered that used rebuilt acoustic couplers are available for about $150, so we could make our own home terminal for $350 (and lots of time and talent). And then, time share costs bottomed out. $0.99 per hour for midnight to 6 AM (what better hour for game-playing?) on an HP2000 system. Prime time costs less than $5 per hour. Most local time sharing companies had all of our games in their libraries plus many other good games, so why not? Home computing is a reality and at palatable costs!!!

another set of events

That's one set of events. You've all played Pong, haven't you? That little game has made Nolan Bushnell and Atari Company millionaires a few times over (8500 units sold last year). What's Pong? . . . the guts of a TV and a PC board plus a few gizmos and a coin slot. Atari's success has attracted competitors and with competition has come improvements in the types of games available both from Atari and from the competition. Star Trek-type games are now found at your local bar and bowling alley. How long before a full-blown computer terminal with all the games we know? WAIT . . . it's already here! Not at your local pub but at your museum . . . Lawrence Hall in Berkeley, OMSI in Portland . . . The Children's Museum in Boston . . . all with games and game-playing computers available to one and all. And don't forget the People's Computer Center has open doors for any and all game playing enthusiasts AND a new PCC-type center is planned for the east coast by an enterprizing group. Costs are still too high for the home consumer but get this – two local inventors just made us a Star Box. That is our *****STARS***** game in a small (8 x 8) box filled with electronic circuitry with randomizing and logic capability. How soon will it be before they have a variety of games available in that little box at some tiny price?

And then, we wrote a games book with Hewlett-Packard which is jsut fantastic! This book should aid the cause to "institutionalize" or "legitimize" computer game playing for all your computer types who have been clandestinely playing computer games at nights and on weekends (we get letters from you guys daily). The PCC-HP games book, along with *101 BASIC GAMES* by Dave Ahl, couldn't have been published three years ago – "heresy" they would have said – "waste of time" other would say. But today, verrry acceptable and very popular. Not to forget that new little book *Games, Tricks and Puzzles for a Hand Calculator* (Wallace Judd, published by Dymax) which shows you how to have fun with your four-function calculator.

Once the big institutions start dealing with "it", consider "it" acceptable! What about the institutions? DEC published the *101 Basic Games* book and they are now toying with the home computer. A special group within the company was formed to investigate the subject and make recommendations. Xerox has their "think tank" near us in Palo Alto. We keep hearing rumors that they will soon open a recreational computer center to test their neat little Dynabook. Dynabook, according to rumor, is an under-the-arm computer which will sell for under $500. It will have a video screen and light pen type device and it will be programmable in the language SMALLTALK (for kids?). Carry it around with you for home or school use or for recreation and FUN! Who knows what HP is doing? With all the dandy, little, powerful calculators they keep developing, can a low cost, powerful, game-machine be far behind? The INTEL 8008 chip is attracting a huge following. With the type of people we know showing interest in it, can a game machine built around the chip be far away?

Put it all together and what do we have? Technological investigation on all fronts developing new devices. Costs coming down to where the home computer or terminal is a practical reality and public acceptability of computer gaming so we don't have to play "behind closed doors."

What else? What does the future bring? What are you doing or hearing about that you can share with us? Write us a letter and bring us up to date.

GEORGE, THE KLINGONS ARE ATTACKING!
STAR TREK
C'MON, DAD DON'T I GET A CHANCE?
FIRE PHOTON TORPEDOES!
PeterKat

Lh Ray

My Dear Dragons

TTY REPAIR

I've found a number of useful, free manuals for the amateur TTY repairman:

1. 310B Vol. I: Model 33 Lubrication, Principles of Operation & Dissassembly.
2. 310B Vol. II: Model 33 Adjustments
3. Teletype publications price list.
4. 1184B: Model 33 parts (full of neat exploded diagrams of everything — like an auto parts book).
5. Section 570-005-800TC (section of what, I don't know): Maintenance Tools Catalog.
6. Parts and Tools price book.

I got these free by requesting them from my local TTY sales office, but I suppose one could write to Skokie as well.

Another very helpful trouble shooting and routine maintenance guide is:

Mod 33 Field Maintenance Practice
Bell System Practices Plant Series
Section 579-200-250
Issue 2, Oct 1969
AT & T Co.

This was prepared for AT & T by TTY and is the book that phone company TTY repairmen carry.

I've also put together a tool kit which readers might find of interest. I'll enclose a list of the tools, with TTY part numbers and prices where relevant.

Jerry Silver, a *very* helpful person I met thru PCC helped with both the tool kit and the publications.

News of useful tools, publications, maintenance and troubleshooting tips would be welcome.

Larry Press
128 Park Place
Venice, CA 90291
(213)399-2083

TOOL KIT FROM LARRY PRESS

1. 3/16" 1/4" 5/16" nut drivers
2. Small Allen wrenches (.050, .062, .078,.093)
3. Screwdrivers (TTY sells some nice ones, e.g., $1.10 for 10" blade with a spring loaded screw holder on the tip.)
4. Spring stretching hooks - available very cheap from TTY, e.g., No.75503 for 0.33 is the most expensive (I went ape and got 6 for $1.38!)
5. Tweezer - another TTY bargain, No. 151392 for 0.57.
6. Oil can with spout — TTY's isn't cheap, but it is a beauty, No. 103625 for $7.05.
7. Oil "syringe" — No. 100688, $1.70 or No. 194553 for $5.45, I had my own so I've not seen these, but they look like functionally equivalent from their pictures.
8. Typeball adjusting tool - No. 180588, $0.11.
9. Plastic pad to work on - No. 124828, $0.26.
10. Orangewood sticks - the mark of a true pro — bevelled on one end, pointed on the other, No. 94646, $0.09 each (I got 5).
11. Hammers - the rubber goodies that strike the typeball, No. 180502, $0.11 each.
12. Grease - No. 88973, $0.85 — a lifetime supply.
13. Oil - No. 88979, $1.85 — another lifetime supply.
14. ¼ inch flat wrench (box, open end) No. 187186, $0.63.
15. Ity bity flat box wrench, No. 114201, $0.15.
16. Armature clip - No. 185832, $0.93. It turns our that an orangewood stick is just as good and is $0.84 cheaper.
17. A flashlight.
18. Tape reader gauge - No. 183103, $0.20.
19. 90 degree screwdriver (offset, flat) No. 94645, $2.45 — an unnecessary luxury.
20. Spare fuses.
21. Ribbons - No. 181129, $0.51 — cheap, but low quality.

Things I might get next time:

A. Selectro removal tool - No. 184098, $1.90.
B. Handwheel (No. 161430, $1.90) and handwheel adapter (No. 181465, $2.65) — these just turn the motor over, but it's faster than by hand and saves wear and tear on your fingers.

INTERESTED LAYMAN

I got your name from Kirk Brainerd, and am fascinated by the fact that there is at least one self-supporting public interest computer center in existence. Any information about the People's Computer Company would be appreciated.

My point of view is that of the interested layman who has learned enough BASIC to start development of a series of "worm's eye-level" informational dialogs for the California Law Center.

Also enclosed are a listing and paper tape of my first essay, "CLCL." Any comments and/or suggestions would be most welcome.

Nancy (my wife) and I are starting work on "CLC2" on the subject "You and the Police" — with the cooperation ofthe ACLU (of which we are long time members).

We are working through Larry Press's "Public Access Terminal" located at the Venice branch of the LA Public Library, with access to the Hewlett-Packard 2000 belonging to the USC Graduate School of Business Administration (where Larry teaches).

A prime motivation of mine is to develop enough computer "sense" and literacy to be able to work with community groups wishing to develop their own programs in BASIC. If one layman can learn something, others should be able to do the same.

Horace Gaims
713 Georgina Avenue
Santa Monica, CA 90402

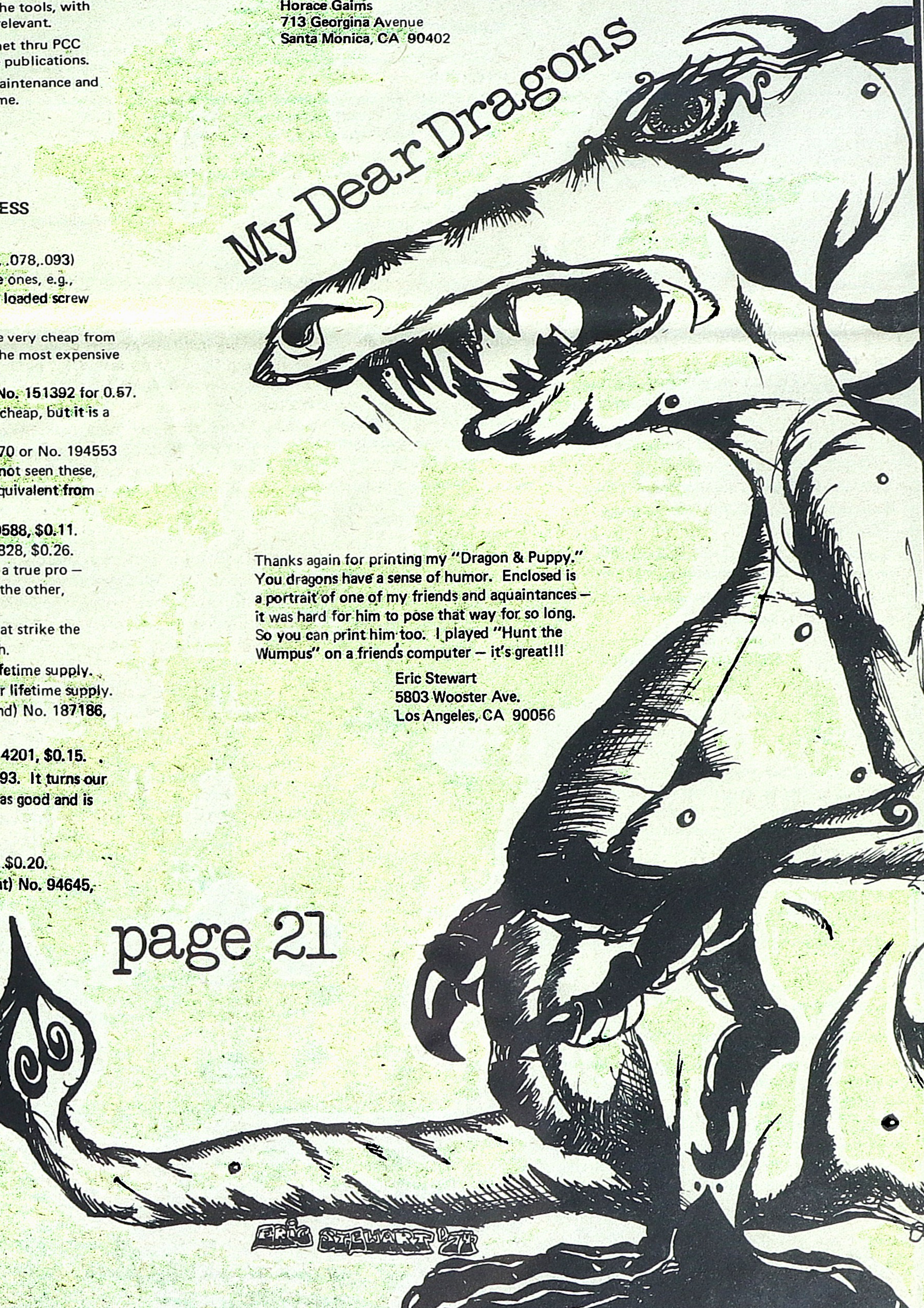
DEAR LEROY

I take the liberty of calling you LeRoy, cause you said to, many moons ago in a BASIC weekender at UCSD, and also because I have been accused of dropping your name, which I did, and it was meaningless, until the papers arrived, thanks to Miss Sanguenetti at ACM, and then they believed.

The school was gifted with an installation of TTY and connect time from the fine people at Honeywell, Italia, with us paying the phone, and it has been a good year, but with the normal fine logic of this place, they up and got rid of me, and left themselves without a computer person, and me without a job, so I am winging (water wings) my way home, hence the new address.

In addition, let me say that the March 74 issue was a beautiful thing to read, especially for those who are headed in anyway toward bid, because it is a jungle, and you did a fine job of laying some benchmarks for the pilgrims. Keep up the fine work, and if I can assist you in anyway, just give a yell and I will do.
Thanks for starting me on the BASIC road to programming, I Grasp it, for Transatlantic work it's best.

Glen W. Lamb
2721 East Grant Road
Tucson, AZ 85716



Thanks again for printing my "Dragon & Puppy." You dragons have a sense of humor. Enclosed is a portrait of one of my friends and aquaintances — it was hard for him to pose that way for so long. So you can print him too. I played "Hunt the Wumpus" on a friends computer — it's great!!!

Eric Stewart
5803 Wooster Ave.
Los Angeles, CA 90056

Dear Friends

THE DISABLED CHILD

I am interested in learning how to use the computer as an inter-active device to teach the learning disabled child. Since all of my experience is in teaching and not in computer science I could use all help possible on the type of computer hardware and software that I would need beginning with the simplest descriptions.

I would also like to know if any references to existing literature in this field or centers where such a technique is now in use.

Janet Owen
787 Vose Avenue
Orange, New Jersey 07050

See DRAGONSMOKE ... PAGE 24

ANSWERS ANYONE?

My reason for writing you this rather disorganized letter is to (among other things) ask a few questions.

Number 1. Can you send me a listing of part 2 of Star Trader (the run section). My copy does not seem to work right at all. It has very strange errors – when a ship lands the name of the ship is wrong, but the date is right, no money ever changes hands in buying or selling, and it is only possible to deal in 3.2 x 10E–53 units.

Number 2. I need information on making the good old TV typewriter into a timeshare terminal – you know, a parallel/serial converter, distributor, modem set-up. If anyone else has done this I would really like to know.

Number 3. I have a version of Qubic (in BASIC) that seems to be unbeatable. But someone told me there was a way to win against anyone if you get to go first. Do you know the method? The program is so good that the only thing that has been able even to put it to a draw was itself.

Number 4. I know this sounds crazy, BUT . . . I want to order all your issues. At least now I don't feel so guilty for the quests.

Please rush (at least a fast walk) the back issues.

Number 5. Does anyone have info on fixing a Philco-Ford CRT?

Number 6. Does anyone know where to get a timeshare terminal at a reasonable price?

Here's hoping you'll have some answers.

Andy Finkel
12002 Pandrail Place
Philadelphia, PA. 19116

AN APPEAL

Please donate as tax deductible contribution your obsolete or defective computer equipment (mini's, terminals, peripherals, cassette/tape drives, etc.). We repair, interface and integrate anything ourselves for our non-profit Computer Institute.

In exchange for operational (outmoded) equipment we can use, you may obtain our nationwide services at cost:

training and troubleshooting aids for your field service,

instant quotations and order entry/inventory control for your reps,

material requirement and production planning etc.

Write us what equipment you'd like to swap for our professional engineering services – we will mail you our bulletins and provide a demonstration of our time-sharing remote services on the console in your office. We are dedicated to rehabilitation, continuing education and low cost t/s EDP serviced for small business and small communities, to help them to survive with the aid of our concept of a nationwide non-profit service.

Ernst Schubert, Ph.D. PE-EE
Director of Education
Computer Institute for
Continuing Education
4662 Katella, Los Alamitos 90720

PROCESSING DATA (HELP!)

This year our high school would like to conduct a student teacher evaluation, and I have volunteered to help computer process the data. I have access to an account at Call Computer Co. in Mt. View, where I plan to do the processing. Our problem is that we have no way to efficiently transfer the data to the computer. (30 students x 5 classes x 60 teachers x 40 questions is a lot of typeing on a TTY.) Do you have anything like a mark sense card reader that would convert student marked responses to punched tape? Mag-tape cassette? Or even directly via modem/phone lines to Call Computer? Wewould appreciate any help or information you could provide us, and we would be willing to pay any costs involved (for cards, tape, time, rent, etc.).

Greg Skyles
Associated Student Body of
Monta Vista High School
10301 Stonydale Dr.
Cupertino, CA 95014

BUILD YOUR OWN MINI

& HELP START A PC CENTER ?

It was a pleasure meeting you dragons and seeing the dragon's den.

I am a 35 year old computer phreak and work in New York City helping support a conglomerate of medium and large Burroughs computers.

I am serious about becoming involved in an eastern version of PCC in the N.Y.C. area. A meeting place and a mini-computer are needed for starters, I think the people help would come of its own accord after the other two where established.

In Vol. 2, No. 1, page 5, Gregory Yob and Joe Weisbecker had articles on computers for the individual. An outfit called M.P. Publishing agrees with them and is publishing a series on building your own mini. This is not for the faint of heart however. Interested persons should write to:

M.P. Publishing
Box 378
Belmont, MA. 02178

and ask for Catalog 2.

Another group that is open to all who are interested in building and operating digital computers is the:

Amateur Computer Society
260 Noroton Avenue
Darien, Conn. 06820

Keep up the great work.

George Fischer
72 South Railroad Ave.
Staten Island, NY 10305

SORRY ERIC . . .

Thanks for printing my letter. I truly appreciate it. However, while everyone else in "letters" had his address printed, I didn't. While a slight oversight, I would appreciate it if you would print my address. Other than this, I liked Vol. 3, No. 1 and can hardly wait for *What to do After you Hit Return.* Anyway, thanks for all.

Forever in your debt,
Eric Haines (The FORTRAN Kid)
212 North Riding Drive
Moorestown, NJ 08067

PS I'm on pg. 21, middle of page, Vol. 3, No. 1
PPS GOTO 10

BASIC COMPILER

At the Minneapolis NCTM meeting I talked to someone from you company about a BASIC compiler for an IBM 1620 Model I. I was told to write to you and inquire about such a compiler. If some publisher of BASIC texts could write or find one for us, we would be more than happy to patronize such a company. At the present we have no use for BASIC materials.

Dr. Janis A. Tupesis
Math Coordinator
Monona Grove High School
4400 Monona Drive
Monona, WI 53716

WHAT'S A 1620 ?

HARDBOUND OR PAPER?

Some random comments encouraged by your paper. We have used a CRT terminal, the Applied Digital Data Systems Consul 580, for a semester without a failure. Installation was made by DEC on our 8K PDP8/E. We use BASIC and the 580 operates at 1200 band in time sharing mode with the teletype. Students prefer the CRT to the Teletype when the convenience of paper tape is not a critical factor.

Here is a suggestion. Most of the texts on programming you discuss are paperbacks. In the past, my inclination was exclusively toward using that type but lately the hardbound texts seem to include some interesting editions, e.g., "Fundamental Programming Concepts" by J. Gross of Harper-Row. You might consider publishing a survey of the hard stuff.

George H. Dubay
University of St. Thomas
Prof. Math/Stat Dept.
3812 Montrose Blvd.
Houston, TX 77006

Surveys will be gleefully accepted.

Sirs:

'FIRST LAW OF THE 1108' —

I AM A COMPUTER. I AM DUMBER THAN ANY HUMAN AND SMARTER THAN ANY PROGRAMMER.

ART WORK BY ANTHONY KUBINSKI (MORTICIAN PAR EXCELLANCE)

NEWS FROM THE OLD COUNTRY

Kerstin Aner has written to me to say that you are involved in setting up community information services and that you may be able to put me in contact with others who are working on a People's Computer Centre. She and I met recently at conferences in Gothenburg and Vienna. At the meeting in Vienna we heard John Carroll of the University of Western Ontario on the subject of their People's Computer in London Ontario. Inspired by this, I am trying to interest my colleages in developing a similar service in London, England. It would be a great help to know also about the work that you have been doing in California.

My work is on a very long-term research project to make statute law easier to computerise. You may be interested, so I enclose a copy of a paper about it. Please note that there will not be any practically useful results for a couple of years, at least.

It is possible that a colleague who is working with me on this project may be able to visit one of these centers where experiments are being conducted in the field of community computer services. It will help meanwhile if we could receive any accounts written on the work being done in California or references to any accessible publications. I understand, also that you produce a paper to which we might subscribe.

Ronald Stamper
The London School of
Economics and Political Sci.
Houghton Street
London, WC2A 2AE

TELETYPES

Your information on Teletypes was a work of art and more importantly — truth. I'd love to give a reprint of your article to some of the people who contact us. Lots of savvy advice.

We service Southern California and provide Teletypes and terminals on a nationwide basis through a nationwide service agreement with Western Union. Our contract prices look like this:

ASR33	55/mo. Year Lease	$950 Purchase
Acoustic Coupler	15/mo.	$150-$300 Purchase

These Teletypes are completely reconditioned units and are warrantied — all parts and labor — for 90 days. Not such a bad deal at all.

If you are so moved, how about letting your readers know that we provide sales, rentals, maintenance and parts.

Gee, thanks.

Jim Corcoran
Sales Manager
Terminal Systems, Inc.
11300 Hartland St.
No. Hollywood, Ca. 91605

DON DAVIS

The Starbow

A shout of triumph
A cry of delight
Will pierce the interstellar night
At the wonderous spectacle
Which does unfold
For our eyes only
To behold
As our fleet approaches
The speed of light
See the spectrum of nature
Laid bare to our sight
The starbow ahead
Whose colors so bright
Define the limits
Of visible light
All wavelengths surround us
But what our eyes see
Lies only between
Infra-red and UV
Such privelaged visions
Await those who seek
To climb the
Technological peak
Which forged our engines
Whose nuclear fury
Propells us onwards
To alpha centauri!

Don Davis

Dear PCC

TEACHING POSITIONS AVAILABLE

The Interdata 7/16 was competively selected (32 systems) to be supplied to the United States Dependents Schools, European Area. The largest system will have 12 terminals. The first ten systems are to be installed in our high school during November of this year and the other twenty two by August of '76. The specifications of the 7/16 look Great!

Our target is to use the computers as an integral part of the math, science, social science, and business education curricula. Here, at the Darmstadt Career Center, we are developing a Computer Technology program for students and will provide implementation support to the high schools.

We are looking for experienced teachers interested in giving a helping hand to develop the computer cirriculum program. Applicants for teaching positions for school year '75-76 must apply before 31 December 1974. Forms may be obtained from:

HQDA (DAPE-CPC-RT)
Forrestal Bldg., Room GB171
Washington, D.C. 20314

Sam W. Calvin
Coordinator Computer Education
Darmstadt Career Center
USDESEA
APO New York 09175

If you go to Europe — write us a letter!

WANTED — SMALL COMPUTER

I am looking for a PDP8/M computer. Since I am interested in a small machine for personal use, price is a primary consideration (the range I have in mind is from a few hundred to about a thousand dollars). I am familiar with a PDP8/M and so it is for this reason that I ask about a PDP8. I would greatly appreciate any information or assistance you might offer.

Sorosh Ahmed
201 E. 28 St.
New York, NY 10016

HOME COMPUTER

I'd like to ask your advice on buying a small computer for home use. More specifically, what characteristics should I look for and how can I buy one without going broke? I have spent the last year building some of the required peripherals — keyboard, display (using a TV set) and modified audio cassette for bulk storage — but building a computer is beyond my skills. What I sort of had in mind was something in the PDP/8 or NOVA class, with enough memory to use BASIC and with readily available software that doesn't have to be bought from the manufacturer. Processing speed doesn't matter too much, because the system will only be used in an interactive mode.

New, these things are way out of my price range, but something must happen to old minicomputers when they're retired. Is there a market in used machines? How about broken ones that are fixable but not worth the manufacturer's while to restore? (I have access to EE help—). Or what happens to discontinued machines (e.g., RCA or small Honeywell)?

Jim McCord
330 Vereda Leyenda
Goleta, CA 93017

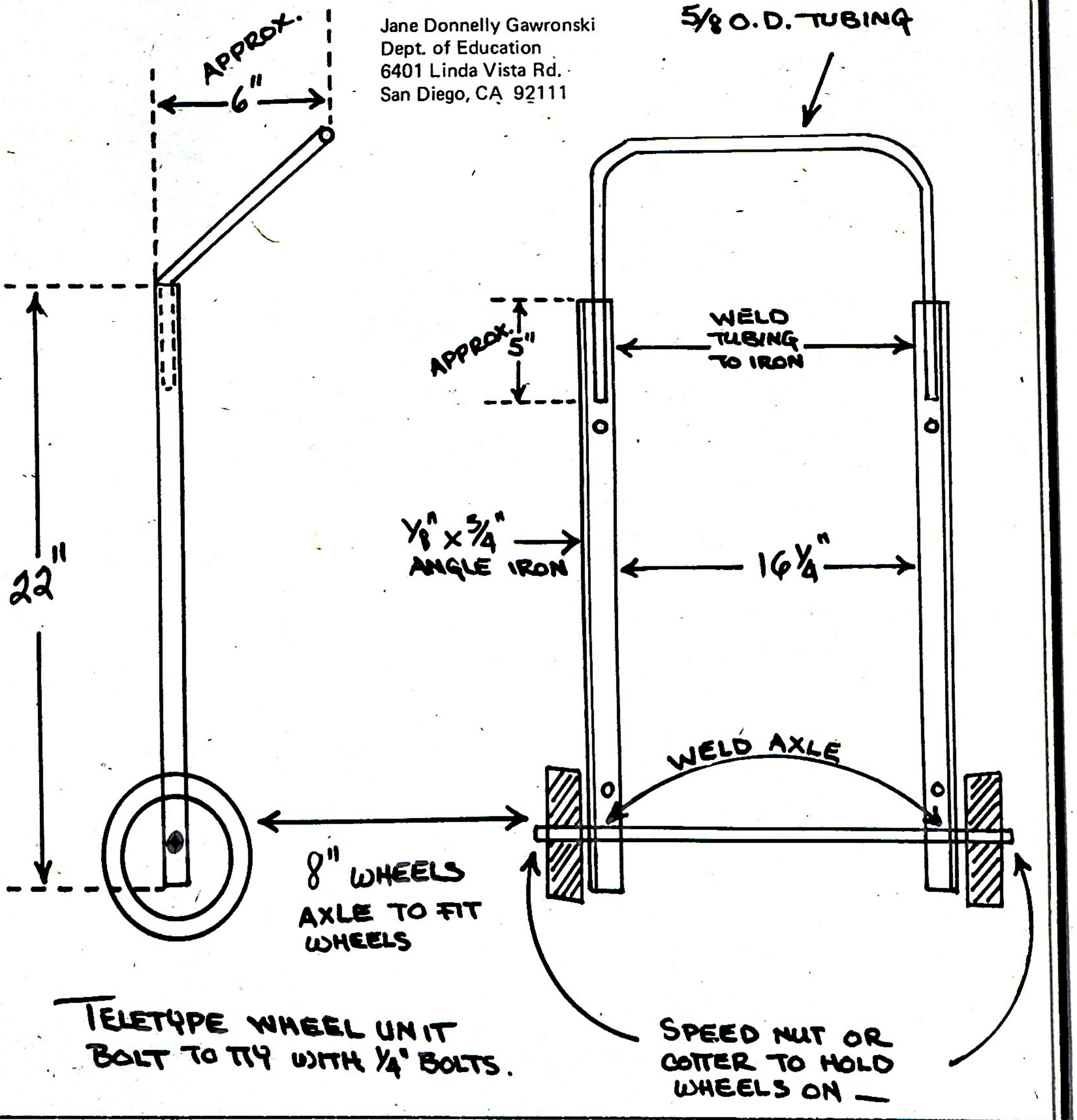
Keep reading PCC

Dear Lola

TTY WHEEL UNIT

Enclosed is a set of plans for the wheel and handle kits for a teletype terminal. When I was in Mpls., they were made by J.M. Welding, 6248 71st Ave., North Minneapolis, MN. 55429. They charged $22 per set. The plans originally came from the Minneapolis Public Schools. I hope you find this information helpful.

Jane Donnelly Gawronski
Dept. of Education
6401 Linda Vista Rd.
San Diego, CA 92111



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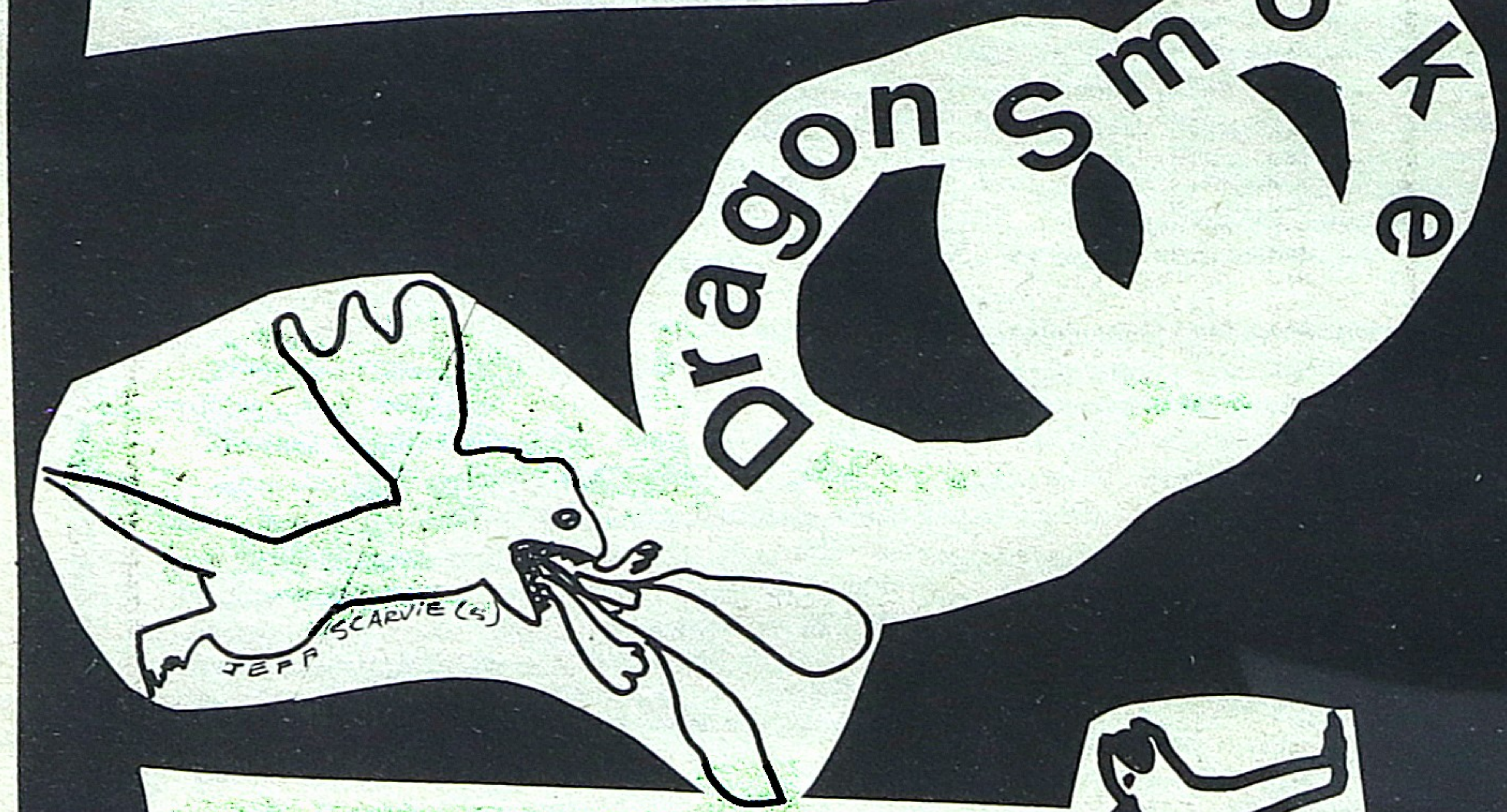
* The best beer for dragons is

Bob

ANCHOR BRAND

STEAM BEER

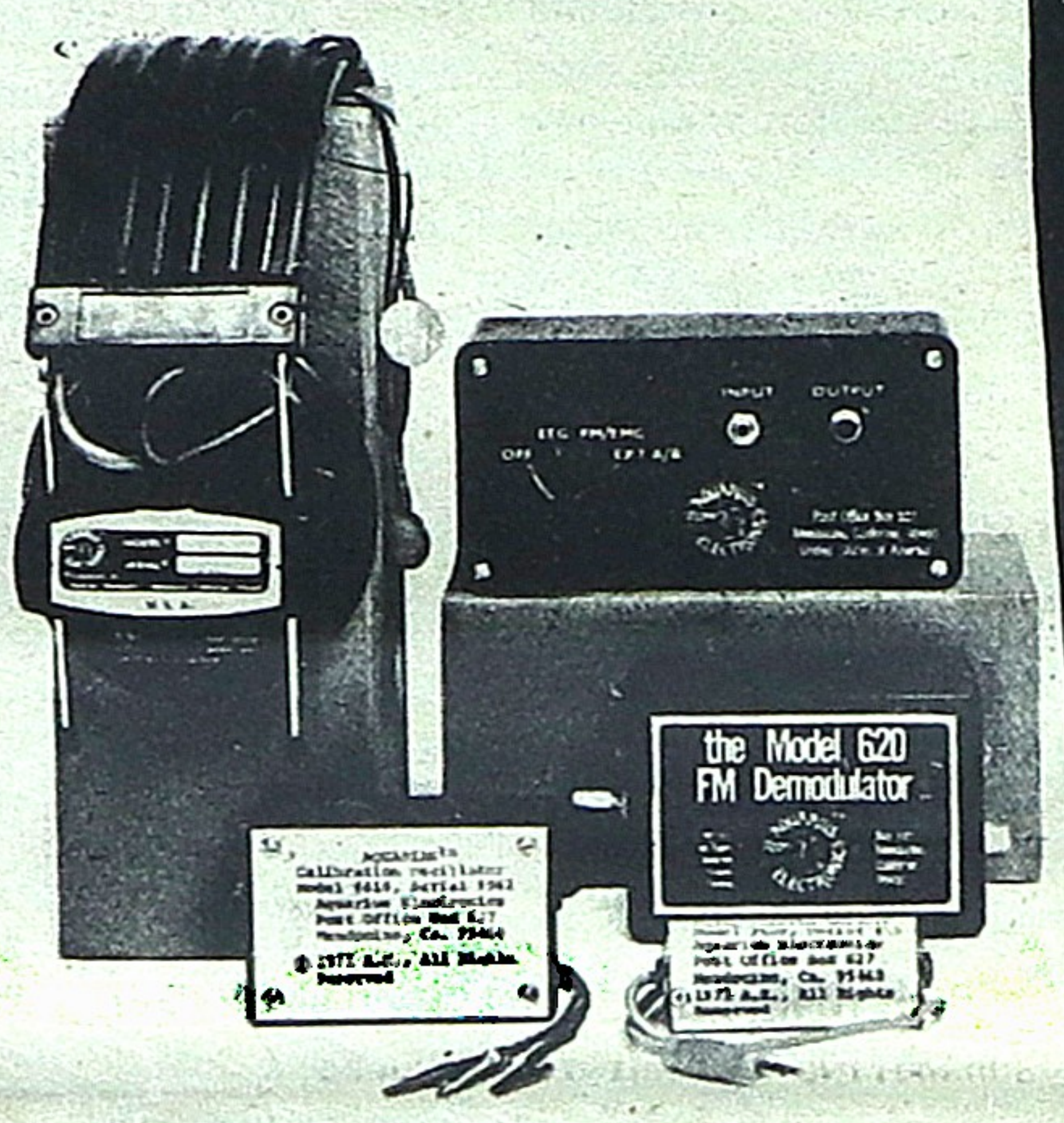
541 - 8th Street ★ San Francisco 94103



ESP

Biofeedback? Electronic ESP?

Catalog from:
AQUARIUS ELECTRONICS
P.O. Box 96 - D
Albion, Ca. 95410



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Hal Singer
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Lompoc, Ca. 93436

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*** M.P. PUBLISHING CO.**
Box 378
Belmont, MA 02178

Ask about *The Experimenter's Computer System ecs - 8*. . . a series of booklets to help individuals create personal computer systems.

Here are more → LISTINGS

REVERSEESREVER

```
100 REM *** REVERSE - A GAME OF SKILL
110 REM *** PEOPLE'S COMPUTER COMPANY, MENLO PARK CA
120 RANDOM
130 DIM A(20)
140 REM *** N = NUMBER OF NUMBERS (1 THRU N)
150 LET N=9
160 PRINT "DO YOU WANT THE RULES (1=YES  0=NO)";
170 INPUT A
180 IF A=0 THEN 210
190 GOSUB 710
200 REM *** MAKE A RANDOM LIST A(1) TO A(N)
210 LET A(1)=INT((N-1)*RND(0))+2
220 FOR K=2 TO N
230 LET A(K)=INT(N*RND(0))+1
240 FOR J=1 TO K-1
250 IF A(K)=A(J) THEN 230
260 NEXT J
270 NEXT K
280 REM *** PRINT ORIGINAL LIST AND START G
290 PRINT
300 PRINT "HERE WE GO ... THE LIST IS:"
310 LET T=0
320 GOSUB 610
330 PRINT "HOW MANY SHALL I REVERSE";
340 INPUT R
350 IF R=0 THEN 520
360 IF R<=N THEN 390
370 PRINT "OOPS! TOO MANY - I CAN REVERSE AT MOST";N
380 GO TO 330
390 LET T=T+1
400 REM *** REVERSE R NUMBERS AND  PRINT NEW LIST
410 FOR K=1 TO INT(R/2)
420 LET Z=A(K)
430 LET A(K)=A(R-K+1)
440 LET A(R-K+1)=Z
450 NEXT K
460 GOSUB 610
470 REM *** CHECK FOR A WIN
480 FOR K=1 TO N
490 IF A(K)<>K THEN 330
500 NEXT K
510 PRINT "YOU WON IN";T;"MOVES!!!"
520 PRINT
530 PRINT "AGAIN (1=YES  0=NO)";
540 INPUT A
550 IF A<>0 THEN 210
560 STOP
600 REM *** SUBROUTINE *** PRINT LIST A(1) TO A(N)
610 PRINT
620 FOR K=1 TO N
630 PRINT A(K);
640 NEXT K
650 PRINT
660 PRINT
670 RETURN
700 REM *** SUBROUTINE *** PRINT THE RULES
710 PRINT
720 PRINT "THIS IS THE GAME OF 'REVERSE'. TO WIN, ALL YOU HAVE"
730 PRINT "TO DO IS ARRANGE THE LIST OF NUMBERS (1 THROUGH";N;")"
740 PRINT "IN NUMERICAL ORDER FROM LEFT TO RIGHT. TO MOVE, YOU"
750 PRINT "TELL ME HOW MANY NUMBERS (COUNTING FROM THE LEFT) TO"
760 PRINT "REVERSE. FOR EXAMPLE, IF THE CURRENT LIST IS:"
770 PRINT
780 PRINT " 2 3 4 5 1 6 7 8 9"
790 PRINT
800 PRINT "AND YOU REVERSE             ULT WILL BE:"
810 PRINT
820 PRINT " 5 4 3 2 1 6 7 8 9"
830 PRINT
840 PRINT "NOW, IF YOU REVERSE 5, YOU WIN!"
850 PRINT
860 PRINT " 1 2 3 4 5 6 7 8 9"
870 PRINT
880 PRINT "NO DOUBT YOU WILL LIKE THIS GAME OF SKILL, BUT"
890 PRINT "IF YOU WANT TO QUIT, REVERSE 0 (ZERO)."
900 PRINT
910 RETURN
999 END
```

Here's another way to scramble the original list.

```
210 FOR J = 1 TO N
220 A(J) = J
230 NEXT J
240 FOR J = N TO 2 STEP -1
250 K = INT(J*RND(0))+1
260 T = A(J)
270 A(J) = A(K)
280 A(K) = T
290 NEXT J
```

Ginny Clark of the University of Georgia wrote us about "timings" involved with scrambling algorithms for REVERSE.

(Vol 2, No. 5, p. 17)

beyond bagels

```
10   REM *** BEYOND BAGELS ***
20   REM *** G CONTROLS THE MAXIMUM NUMBER OF GUESSES
30   G=20
40   PRINT "WELCOME TO   *** BEYOND BAGELS ***"
50   PRINT
60   PRINT "RULES (1=YES 0=NO)";
70   INPUT X
80   PRINT
90   IF X <> 1 THEN 310
100  PRINT "   I'LL THINK OF A THREE DIGIT NUMBER (LIKE 532)"
110  PRINT "AND YOU HAVE";G;"TRIES TO GUESS IT.  AFTER YOU TELL ME"
120  PRINT "YOUR GUESS, I'LL PRINT YOUR SCORE FOR THAT GUESS."
130  PRINT
140  PRINT "YOU GET 1 POINT FOR EACH DIGIT THAT'S ALSO IN MY NUMBER,"
150  PRINT "AND ANOTHER POINT FOR EACH CORRECT DIGIT THAT'S ALSO"
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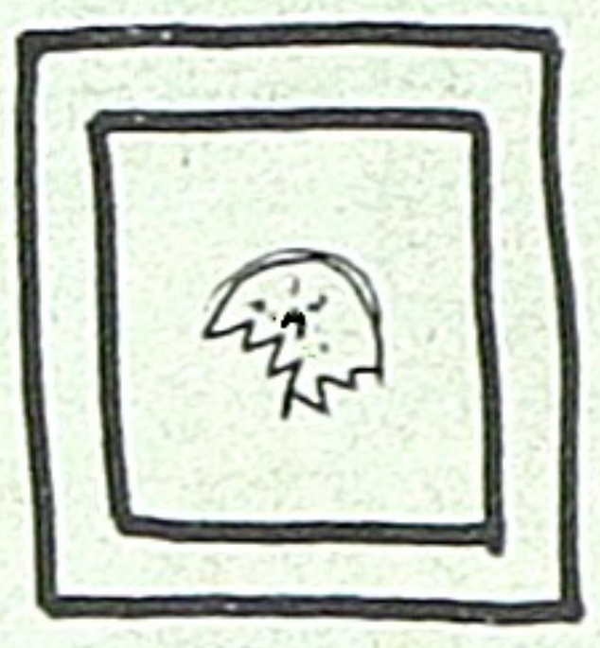
240  PRINT "YOU GET 3 POINTS (2 BECAUSE OF THE 6, AND"
250  PRINT "THE 9 ADDS THE OTHER POINT"
260  PRINT
270  PRINT "BUT BE CAREFUL!  SOME SCORES (LIKE 3 POINTS)"
280  PRINT "CAN BE MADE IN MORE THAN ONE WAY !!!"
290  PRINT
300  PRINT "HERE WE GO..."
310  DIM A[3],B[3]
320  A[1]=INT(RND(0)*9)+1
330  A[2]=INT(RND(0)*10)
340  IF A[2]=A[1] THEN 330
350  A[3]=INT(RND(0)*10)
360  IF A[3]=A[2] THEN 350
370  IF A[3]=A[1] THEN 350
380  PRINT "I'VE PICKED MY NUMBER"
390  PRINT
400  FOR G1=1 TO G
410  PRINT
420  PRINT "GUESS #";G1;
430  INPUT X
440  IF X >= 100 AND X <= 999 THEN 470
450  PRINT "HINT:  MY NUMBER HAS THREE DIGITS"
460  GOTO 410
470  P=0
480  FOR I=1 TO 3
490  B[I]=INT(X/100)
500  X=10*(X-100*B[I])
510  NEXT I
520  IF P=6 THEN 750
530  IF B[1] <> B[2] AND B[1] <> B[3] AND B[2] <> B[3] THEN 560
540  PRINT "HINT:  IN MY NUMBER, ALL THE DIGITS ARE DIFFERENT"
550  GOTO 410
560  FOR I=1 TO 3
570  FOR J=1 TO 3
580  IF B[I] <> A[J] THEN 620
590  P=P+1
600  IF I <> J THEN 620
610  P=P+1
620  NEXT J
630  NEXT I
640  IF P=6 THEN 750
650  IF P <> 1 THEN 680
660  PRINT P;"POINT FOR THIS ONE"
670  GOTO 690
680  PRINT P"POINTS FOR THIS ONE"
690  NEXT G1
700  PRINT
710  PRINT
720  PRINT "SORRY YOU DIDN'T GUESS IT."
730  PRINT "MY NUMBER WAS ";A[1];A[2];A[3]
740  GOTO 820
750  PRINT
760  PRINT
770  PRINT "YOU GUESSED IT IN ";G1;" GUESSES !!!";
780  FOR I=1 TO G/2-G1
790  PRINT "";
800  NEXT I
810  PRINT
820  PRINT "PLAY AGAIN (1=YES 0=NO)";
830  INPUT X
840  IF X=1 THEN 290
850  PRINT "BYE!"
860  END
```

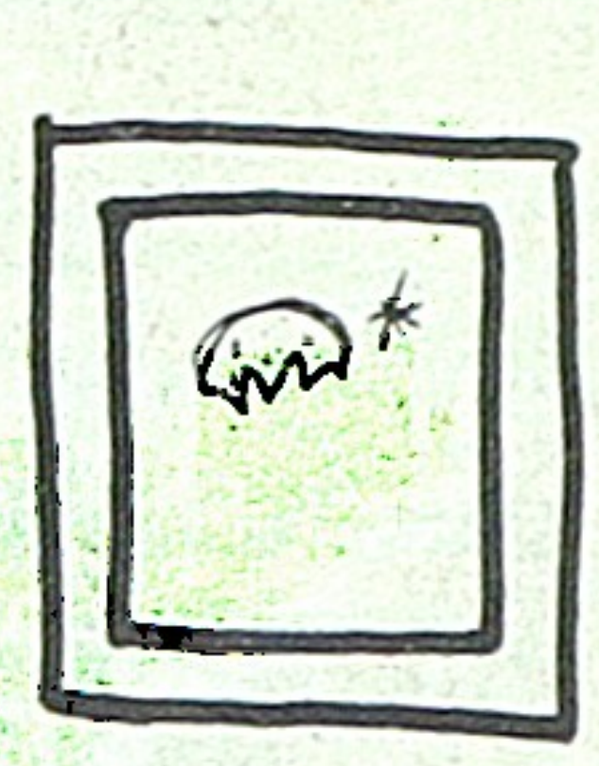
chomp

```
100 REM *** THE GAME OF CHOMP *** COPYRIGHT PCC 1973 ***
110 PRINT
120 PRINT "THIS IS THE GAME OF CHOMP (SCIENTIFIC AMERICAN, JAN 1973)"
130 PRINT "WANT THE RULES (1=YES, 0=NO!)";
140 INPUT R
150 IF R=0 THEN 340
160 F=1
170 R=5
180 C=7
190 PRINT "CHOMP IS FOR 1 OR MORE PLAYERS (HUMANS ONLY)."
200 PRINT
210 PRINT "HERE'S HOW A BOARD LOOKS (THIS ONE IS 5 BY 7):"
220 GOSUB 540
230 PRINT
240 PRINT "THE BOARD IS A BIG COOKIE - R ROWS HIGH AND C COLUMNS"
250 PRINT "WIDE. YOU INPUT R AND C AT THE START. IN THE UPPER LEFT"
260 PRINT "CORNER OF THE COOKIE IS A POISON SQUARE (P). THE ONE WHO"
270 PRINT "CHOMPS THE POISON SQUARE LOSES. TO TAKE A CHOMP, TYPE THE"
280 PRINT "ROW AND COLUMN OF ONE OF THE SQUARES ON THE COOKIE."
290 PRINT "ALL OF THE SQUARES BELOW AND TO THE RIGHT OF THAT SQUARE"
300 PRINT "(INCLUDING THAT SQUARE, TOO) DISAPPEAR -- CHOMP!!"
310 PRINT "NO FAIR CHOMPING SQUARES THAT HAVE ALREADY BEEN CHOMPED,"
320 PRINT "OR THAT ARE OUTSIDE THE ORIGINAL DIMENSIONS OF THE COOKIE."
330 PRINT
340 PRINT "HERE WE GO..."
350 DIM A[10,10]
360 F=0
370 FOR I=1 TO 10
372 FOR J=1 TO 10
375 LET A[I,J]=0
377 NEXT J
379 NEXT I
380 PRINT
390 PRINT "HOW MANY PLAYERS";
400 INPUT P
410 I1=0
420 PRINT "HOW MANY ROWS";
430 INPUT R
440 IF R <= 9 THEN 470
450 PRINT "TOO MANY ROWS (9 IS MAXIMUM). NOW, ";
460 GOTO 420
470 PRINT "HOW MANY COLUMNS";
480 INPUT C
490 IF C <= 9 THEN 530
500 PRINT "TOO MANY COLUMNS (9 IS MAXIMUM). NOW, ";
510 GOTO 470
530 PRINT
540 FOR I=1 TO R
550 FOR J=1 TO C
560 A[I,J]=1
570 NEXT J
580 NEXT I
590 A[1,1]=-1
600 REM PRINT THE BOARD
610 PRINT
620 PRINT TAB(7);"1 2 3 4 5 6 7 8 9"
630 FOR I=1 TO R
640 PRINT I;TAB(7);
650 FOR J=1 TO C
660 IF A[I,J]=-1 THEN 700
670 IF A[I,J]=0 THEN 720
680 PRINT "* ";
690 GOTO 710
700 PRINT "P ";
710 NEXT J
720 PRINT
730 NEXT I
740 PRINT
750 IF F=0 THEN 770
760 RETURN
770 REM GET CHOMPS FOR EACH PLAYER IN TURN
780 LET I1=I1+1
790 LET P1=I1-INT(I1/P)*P
800 IF P1 <> 0 THEN 820
810 P1=P
820 PRINT "PLAYER ";P1
830 PRINT "COORDINATES OF CHOMP (ROW,COLUMN)";
840 INPUT R1,C1
850 IF R1<1 THEN 920
860 IF R1>R THEN 920
870 IF C1<1 THEN 920
880 IF C1>C THEN 920
890 IF A[R1,C1]=0 THEN 920
900 IF A[R1,C1]=-1 THEN 1010
910 GOTO 940
920 PRINT "NO FAIR. YOU'RE TRYING TO CHOMP ON EMPTY SPACE!"
930 GOTO 820
940 FOR I=R1 TO R
950 FOR J=C1 TO C
960 A[I,J]=0
970 NEXT J
980 NEXT I
990 GOTO 610
1000 REM END OF GAME DETECTED IN LINE 900
1010 PRINT "YOU LOSE, PLAYER ";P1
1020 PRINT
1030 PRINT "AGAIN (1=YES, 0=NO!)";
1040 INPUT R
1050 IF R=1 THEN 340
1060 END
```

This version of *CHOMP* uses a doubly-subscripted array, *A*, to keep track of the *cookie*. Can you rewrite the program to use a *singly-subscripted* array, instead?

We had a glimpse of such a program but one of our dragons breathed on it and . . .





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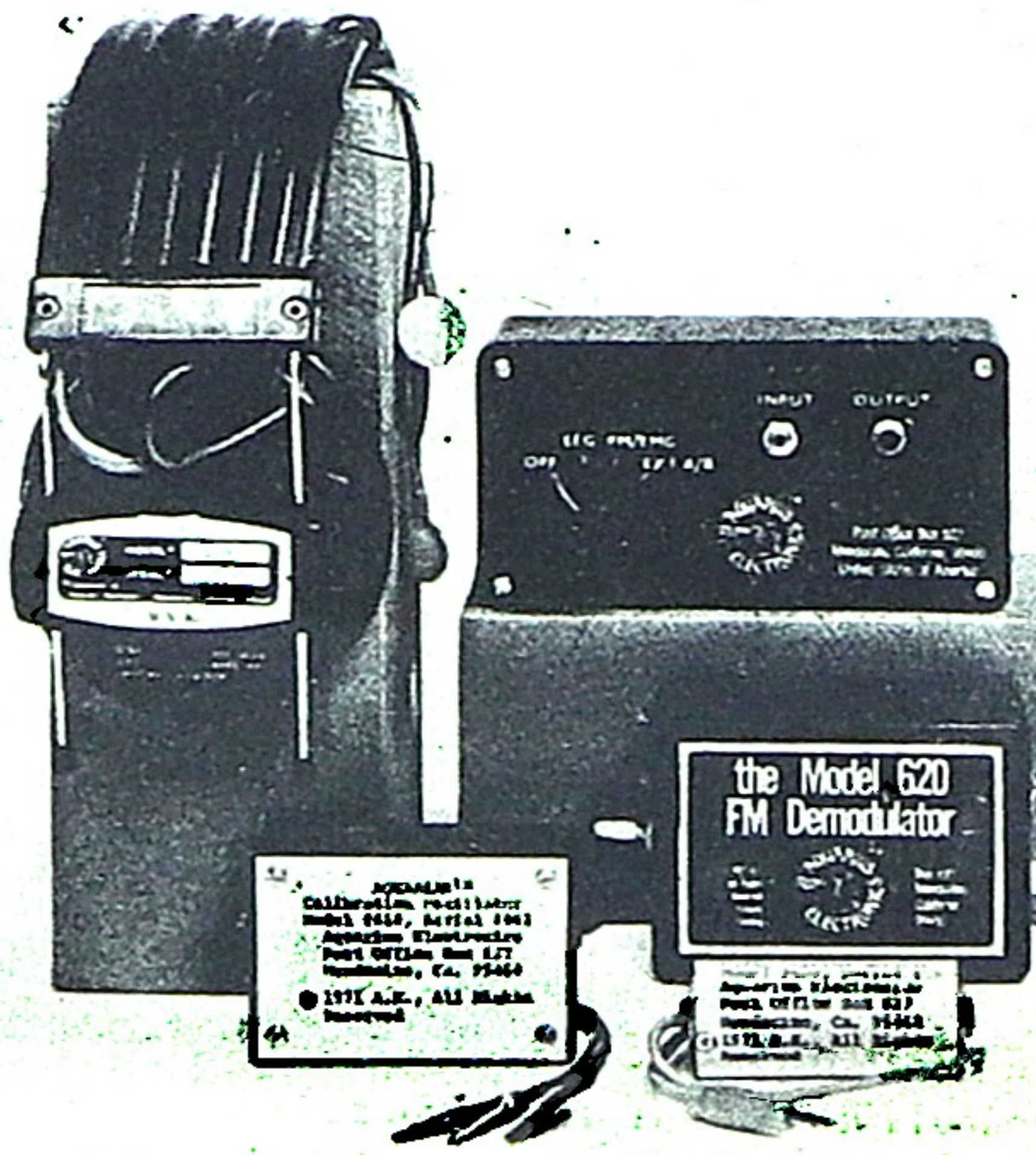

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220 FOR K=2 TO N
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290 PRINT
300 PRINT "HERE WE GO ... THE LIST IS:"
310 LET T=0
320 GOSUB 610
330 PRINT "HOW MANY SHALL I REVERSE";
340 INPUT R
350 IF R=0 THEN 520
360 IF R<=N THEN 390
370 PRINT "OOPS! TOO MANY - I CAN REVERSE AT MOST";N
380 GO TO 330
390 LET T=T+1
400 REM *** REVERSE R NUMBERS AND  PRINT NEW LIST
410 FOR K=1 TO INT(R/2)
420 LET Z=A(K)
430 LET A(K)=A(R-K+1)
440 LET A(R-K+1)=Z
450 NEXT K
460 GOSUB 610
470 REM *** CHECK FOR A WIN
480 FOR K=1 TO N
490 IF A(K)<>K THEN 330
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870 PRINT
880 PRINT "NO DOUBT YOU WILL LIKE THIS GAME OF SKILL, BUT"
890 PRINT "IF YOU WANT TO QUIT, REVERSE 0 (ZERO)."
900 PRINT
910 RETURN
999 END
```

Here's another way to scramble the original list.

```
210 FOR J = 1 TO N
220 A(J) = J
230 NEXT J
240 FOR J = N TO 2 STEP -1
250 K = INT(J*RND(0))+1
260 T = A(J)
270 A(J) = A(K)
280 A(K) = T
290 NEXT J
```

***Ginny Clark** of the University of Georgia wrote us about "timings" involved with scrambling algorithms for REVERSE.*

(Vol 2, No. 5, p. 17)

beyond bagels

```
10   REM *** BEYOND BAGELS ***
20   REM *** G CONTROLS THE MAXIMUM NUMBER OF GUESSES
30   G=20
40   PRINT "WELCOME TO   *** BEYOND BAGELS ***"
50   PRINT
60   PRINT "RULES (1=YES 0=NO)";
70   INPUT X
80   PRINT
90   IF X <> 1 THEN 310
100   PRINT "   I'LL THINK OF A THREE DIGIT NUMBER (LIKE 532)"
110   PRINT "AND YOU HAVE";G;"TRIES TO GUESS IT.  AFTER YOU TELL ME"
120   PRINT "YOUR GUESS, I'LL PRINT YOUR SCORE FOR THAT GUESS."
130   PRINT
140   PRINT "YOU GET 1 POINT FOR EACH DIGIT THAT'S ALSO IN MY NUMBER,"
150   PRINT "AND ANOTHER POINT FOR EACH CORRECT DIGIT THAT'S ALSO"
160   PRINT "IN THE CORRECT PLACE."
170   PRINT
180   PRINT "IF MY NUMBER IS    532"
190   PRINT "AND YOU GUESS      421"
200   PRINT "YOU GET 1 POINT (FOR THE 2)"
210   PRINT
220   PRINT "IF MY NUMBER IS    689"
230   PRINT "AND YOU GUESS      692"
240   PRINT "YOU GET 3 POINTS (2 BECAUSE OF THE 6, AND"
250   PRINT "THE 9 ADDS THE OTHER POINT"
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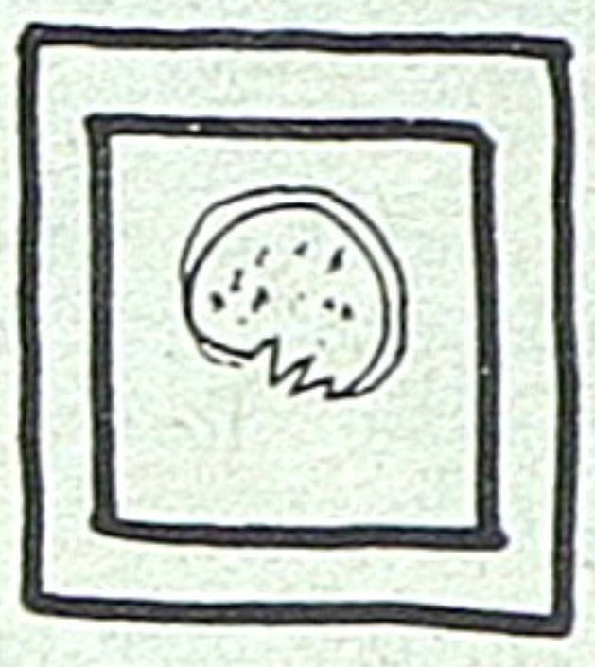
270   PRINT "BUT BE CAREFUL!  SOME SCORES (LIKE 3 POINTS)"
280   PRINT "CAN BE MADE IN MORE THAN ONE WAY !!!"
290   PRINT
300   PRINT "HERE WE GO..."
310   DIM A[3],B[3]
320   A[1]=INT(RND(0)*9)+1
330   A[2]=INT(RND(0)*10)
340   IF A[2]=A[1] THEN 330
350   A[3]=INT(RND(0)*10)
360   IF A[3]=A[2] THEN 350
370   IF A[3]=A[1] THEN 350
380   PRINT "I'VE PICKED MY NUMBER"
390   PRINT
400   FOR G1=1 TO G
410   PRINT
420   PRINT "GUESS #";G1;
430   INPUT X
440   IF X >= 100 AND X <= 999 THEN 470
450   PRINT "HINT:  MY NUMBER HAS THREE DIGITS"
460   GOTO 410
470   P=0
480   FOR I=1 TO 3
490   B[I]=INT(X/100)
500   X=10*(X-100*B[I])
510   NEXT I
520   IF P=6 THEN 750
530   IF B[1] <> B[2] AND B[1] <> B[3] AND B[2] <> B[3] THEN 560
540   PRINT "HINT:  IN MY NUMBER, ALL THE DIGITS ARE DIFFERENT"
550   GOTO 410
560   FOR I=1 TO 3
570   FOR J=1 TO 3
580   IF B[I] <> A[J] THEN 620
590   P=P+1
600   IF I <> J THEN 620
610   P=P+1
620   NEXT J
630   NEXT I
640   IF P=6 THEN 750
650   IF P <> 1 THEN 680
660   PRINT P;"POINT FOR THIS ONE"
670   GOTO 690
680   PRINT P;"POINTS FOR THIS ONE"
690   NEXT G1
700   PRINT
710   PRINT
720   PRINT "SORRY YOU DIDN'T GUESS IT."
730   PRINT "MY NUMBER WAS ";A[1];A[2];A[3]
740   GOTO 820
750   PRINT
760   PRINT
770   PRINT "YOU GUESSED IT IN ";G1;" GUESSES !!!";
780   FOR I=1 TO G/2-G1
790   PRINT "!";
800   NEXT I
810   PRINT
820   PRINT "PLAY AGAIN (1=YES 0=NO)";
830   INPUT X
840   IF X=1 THEN 390
850   PRINT "BYE!"
860   END
```

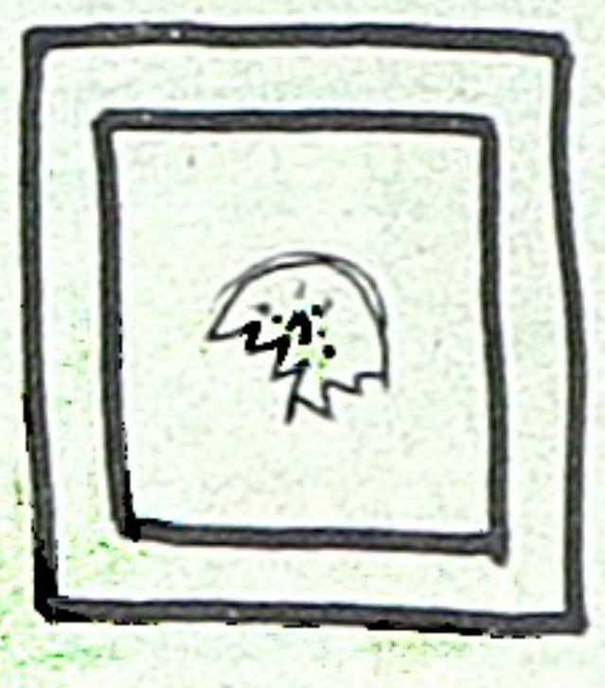
chomp

```
100 REM *** THE GAME OF CHOMP *** COPYRIGHT PCC 1973 ***
110 PRINT
120 PRINT "THIS IS THE GAME OF CHOMP (SCIENTIFIC AMERICAN, JAN 1973)"
130 PRINT "WANT THE RULES (1=YES, 0=NO!)";
140 INPUT R
150 IF R=0 THEN 340
160 F=1
170 R=5
180 C=7
190 PRINT "CHOMP IS FOR 1 OR MORE PLAYERS (HUMANS ONLY)."
200 PRINT
210 PRINT "HERE'S HOW A BOARD LOOKS (THIS ONE IS 5 BY 7):"
220 GOSUB 540
230 PRINT
240 PRINT "THE BOARD IS A BIG COOKIE - R ROWS HIGH AND C COLUMNS"
250 PRINT "WIDE. YOU INPUT R AND C AT THE START. IN THE UPPER LEFT"
260 PRINT "CORNER OF THE COOKIE IS A POISON SQUARE (P). THE ONE WHO"
270 PRINT "CHOMPS THE POISON SQUARE LOSES. TO TAKE A CHOMP, TYPE THE"
280 PRINT "ROW AND COLUMN OF ONE OF THE SQUARES ON THE COOKIE."
290 PRINT "ALL OF THE SQUARES BELOW AND TO THE RIGHT OF THAT SQUARE"
300 PRINT "(INCLUDING THAT SQUARE, TOO) DISAPPEAR -- CHOMP!!"
310 PRINT "NO FAIR CHOMPING SQUARES THAT HAVE ALREADY BEEN CHOMPED,"
320 PRINT "OR THAT ARE OUTSIDE THE ORIGINAL DIMENSIONS OF THE COOKIE."
330 PRINT
340 PRINT "HERE WE GO..."
350 DIM A[10,10]
360 F=0
370 FOR I=1 TO 10
372 FOR J=1 TO 10
375 LET A[I,J]=0
377 NEXT J
379 NEXT I
380 PRINT
390 PRINT "HOW MANY PLAYERS";
400 INPUT P
410 I1=0
420 PRINT "HOW MANY ROWS";
430 INPUT R
440 IF R <= 9 THEN 470
450 PRINT "TOO MANY ROWS (9 IS MAXIMUM). NOW, ";
460 GOTO 420
470 PRINT "HOW MANY COLUMNS";
480 INPUT C
490 IF C <= 9 THEN 530
500 PRINT "TOO MANY COLUMNS (9 IS MAXIMUM). NOW, ";
510 GOTO 470
530 PRINT
540 FOR I=1 TO R
550 FOR J=1 TO C
560 A[I,J]=1
570 NEXT J
580 NEXT I
590 A[1,1]=-1
600 REM PRINT THE BOARD
610 PRINT
620 PRINT TAB(7);"1 2 3 4 5 6 7 8 9"
630 FOR I=1 TO R
640 PRINT I;TAB(7);
650 FOR J=1 TO C
660 IF A[I,J]=-1 THEN 700
670 IF A[I,J]=0 THEN 720
680 PRINT "* ";
690 GOTO 710
700 PRINT "P ";
710 NEXT J
720 PRINT
730 NEXT I
740 PRINT
750 IF F=0 THEN 770
760 RETURN
770 REM GET CHOMPS FOR EACH PLAYER IN TURN
780 LET I1=I1+1
790 LET P1=I1-INT(I1/P)*P
800 IF P1 <> 0 THEN 820
810 P1=P
820 PRINT "PLAYER ";P1
830 PRINT "COORDINATES OF CHOMP (ROW,COLUMN)";
840 INPUT R1,C1
850 IF R1<1 THEN 920
860 IF R1>R THEN 920
870 IF C1<1 THEN 920
880 IF C1>C THEN 920
890 IF A[R1,C1]=0 THEN 920
900 IF A[R1,C1]=-1 THEN 1010
910 GOTO 940
920 PRINT "NO FAIR. YOU'RE TRYING TO CHOMP ON EMPTY SPACE!"
930 GOTO 820
940 FOR I=R1 TO R
950 FOR J=C1 TO C
960 A[I,J]=0
970 NEXT J
980 NEXT I
990 GOTO 610
1000 REM END OF GAME DETECTED IN LINE 900
1010 PRINT "YOU LOSE, PLAYER ";P1
1020 PRINT
1030 PRINT "AGAIN (1=YES, 0=NO!)";
1040 INPUT R
1050 IF R=1 THEN 340
1060 END
```

"This version of *CHOMP* uses a doubly-subscripted array, *A*, to keep track of the *cookie*. Can you rewrite the program to use a *singly-subscripted* array, instead?

We had a glimpse of such a program but one of our dragons breathed on it and . . .





PCC BOOKSTORE

Games, Tricks and Puzzles for a Hand Calculator

Wallace Judd

from *Dymax*
P.O. Box 310
Menlo Park, Ca. 94025

or

PCC Bookstore

$2.95
1974, 100 pages

This book is a necessity for anyone who owns or intends to purchase a hand calculator, from the most sophisticated (The HP-65, for example) to the basic "four banger."

Professor Googol's Flying Time Machine & Atomic Space Capsule

by *Sam Valenza, Jr.*
from: *Intergalactic Publishing or PCC Bookstore*
$3.25
1973; 144 pages

From the Foreword —

"Why do you sit out here all alone?" said Alice, not wishing to begin an argument.

"Why, because there's nobody with me!" cried Humpty Dumpty.

Like Alice, I do not want to begin an argument, but I must also retain my intellectual integrity by stating that this book — an experiment — was written to fill a vacuum. Teaching is a tough job. It has become increasingly necessary to make subject material attractive and interesting. . . . Human beings have a sense of humor, textbooks do not, and over-emphasis of the latter at the expense of the former results in a classroom charade where little is learned except conformism.

In compiling this little book, I've tried to accent some basic unifying concepts while at the same time offering the teacher an overwhelming amount of "jumping off spots" from which he can thoroughly explore Basic Algebra. A lot of this is accomplished tongue-in-cheek, and for that I do not apologize. It is sad to realize that we've arrived at a point where finding some humor in everyday teaching technique may be labeled as experimentation. However, this project is also an experiment in communication, and especially in the visualization of mathematical ideas.

Computer Lib *by Theodor H. Nelson*

from: *PCC Bookstore*
$7.00
1974; 186

From the Summary —

Man has created the myth of "the computer" in his own image, or one of them: cold, immaculate, sterile, "scientific," oppressive.

Some people flee this image. Others, drawn toward it, have joined the cold-sterile-oppressive cult, and propagate it like a faith. Many are still about this mischief, making people do things rigidly and saying it is the computer's fault.

Still others see computers for what they really are: versatile gizmos which may be turned to any purpose, in any style. And so a wealth of new styles and human purposes are being proposed and tried, each proponent propounding his own dream in his own very personal way.

This book presents a panoply of things and dreams. Perhaps some will appeal to the reader . . .

TTL Cookbook

Donald E. Lancaster
from: *PCC Bookstore*
P.O. Box 310
Menlo Park, CA. 94025

$7.95
1974, 335 pages

TTL Cookbook is an excellent book if you have just run into transistor-transistor logic. It is predominately about digital logic. See review on page 12.

BASIC *by Albrecht, Finkel and Brown*
from: *John Wiley & Sons, Inc.*
605 Third Avenue
New York, NY 10026
or
PCC Bookstore

$3.95
1973; 325 pages

Computers and Computation

from: *W.H. Freeman & Company*
660 Market Street
San Francisco, Calif. 94104
or
PCC Bookstore

$4.95
1971; 283 pages

My Computer Likes Me *by Dymax*
from: *Dymax*

from: *PCC*
P.O. Box 310
Menlo Park, Calif. 94025

$1.49
1972; 64 pages

BASIC Programming *by Kemeny and Kurtz*
(2nd Edition)
from: *John Wiley and Sons, Inc.*
605 Third Avenue
New York, NY 10016
$6.95 or PCC Bookstore
1967, 1971; 150 pages

Problems for Computer Solution
by Fred Gruenberger & George Jaffray
from: *John Wiley and Sons, Inc.*
605 Third Avenue
New York, NY 10016

$6.95 or PCC Bookstore
1965; 401 pages

DRAGON SHIRTS by Nancy Hertert
$3.50 (please see cover of September issue).
Children – Sizes S M L
Adult – Sizes S M L

Two Cybernetic Frontiers *by Stewart Brand*
from: *Random House Inc.*
457 Hahn Rd., Westminister, MD 21157
or PCC Bookstore

$2.00
1974;

Affords an operational introduction to Gregory Bateson and (change subject) to computer science.

NEW TITLES FROM THE PCC BOOKSTORE

A Practical, Low-Cost, Home/School Microprocessor System — $1.00
See Excerpts in September 1974 issue of PCC

Steps to an Ecology of Mind — Gregory Bateson — $1.95
See Page 18 of this issue.

Two Cybernetic Frontiers — Stewart Brand — $2.00
See Page 26.

Computer Lib/Dream Machines — Theodor H. Nelson — $7.00
See Page 26.

Whole Earth Epilog — Stewart Brand — $4.00
See Page 18.

Professor Googol — Sam Valenza, Jr. — $3.25
See Page 26.

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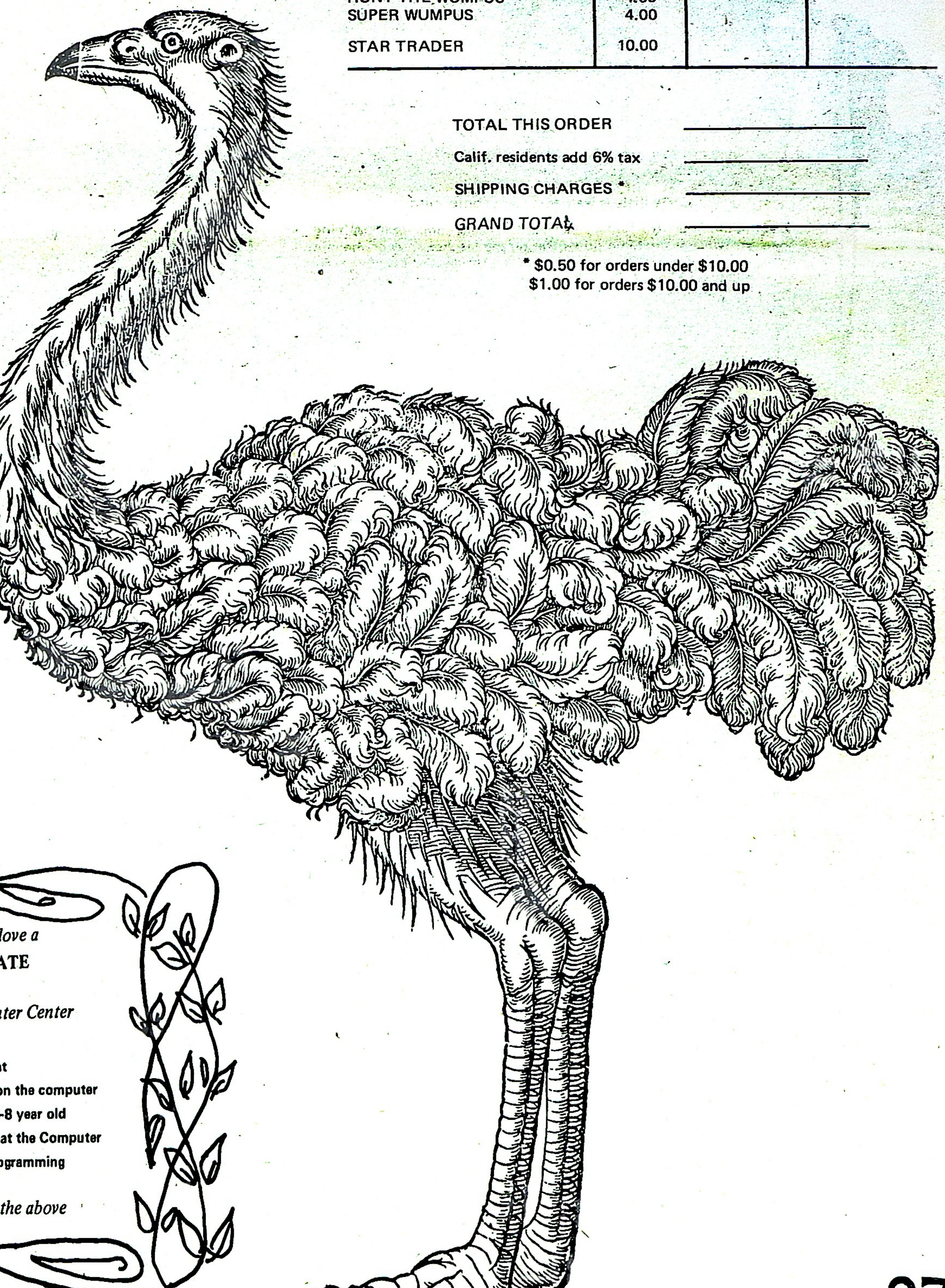
$1.00 for orders $10.00 and up

Some of the above new books really deserve full page reviews — trouble is we are adding books so fast that we don't have space to properly review all of them. We will probably soon start a separate "catalog" publication about books and maybe other stuff (shirts, buttons, posters — maybe: calculators and possibly even CHIPS). Tell you more next issue.



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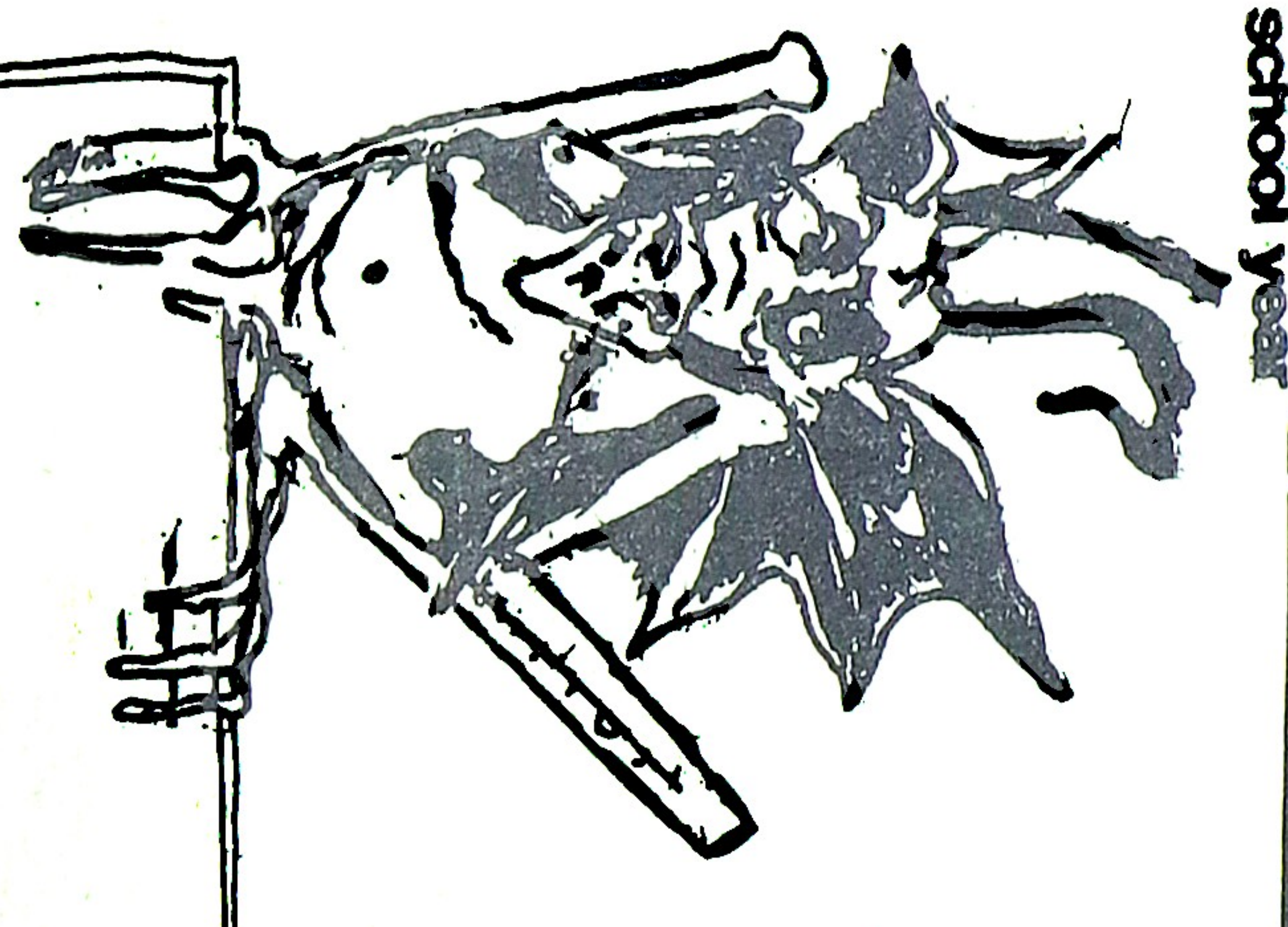

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